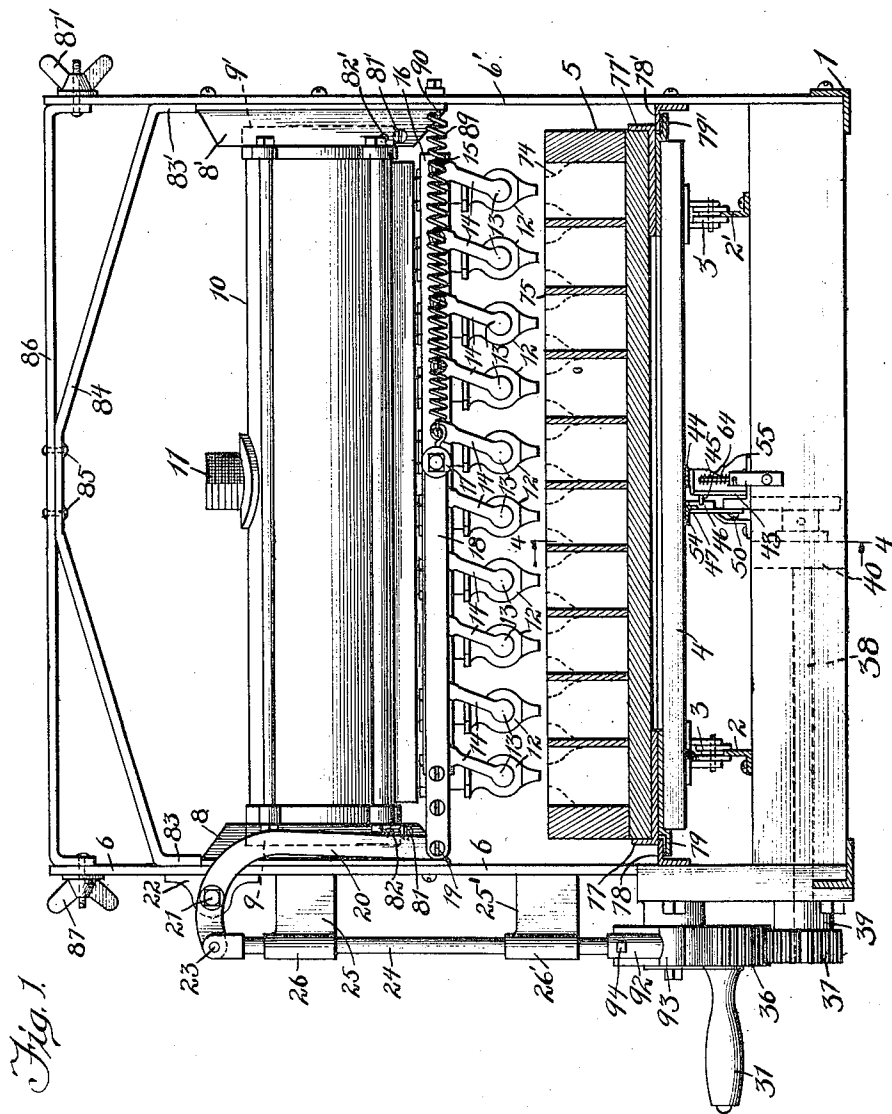


O. COOLEY.
BOTTLE FILLING MACHINE.
APPLICATION FILED NOV. 13, 1908.

1,015,995.

Patented Jan. 30, 1912.

4 SHEETS—SHEET 1.



Witnesses:
J. D. Perry
Chas. H. Seem

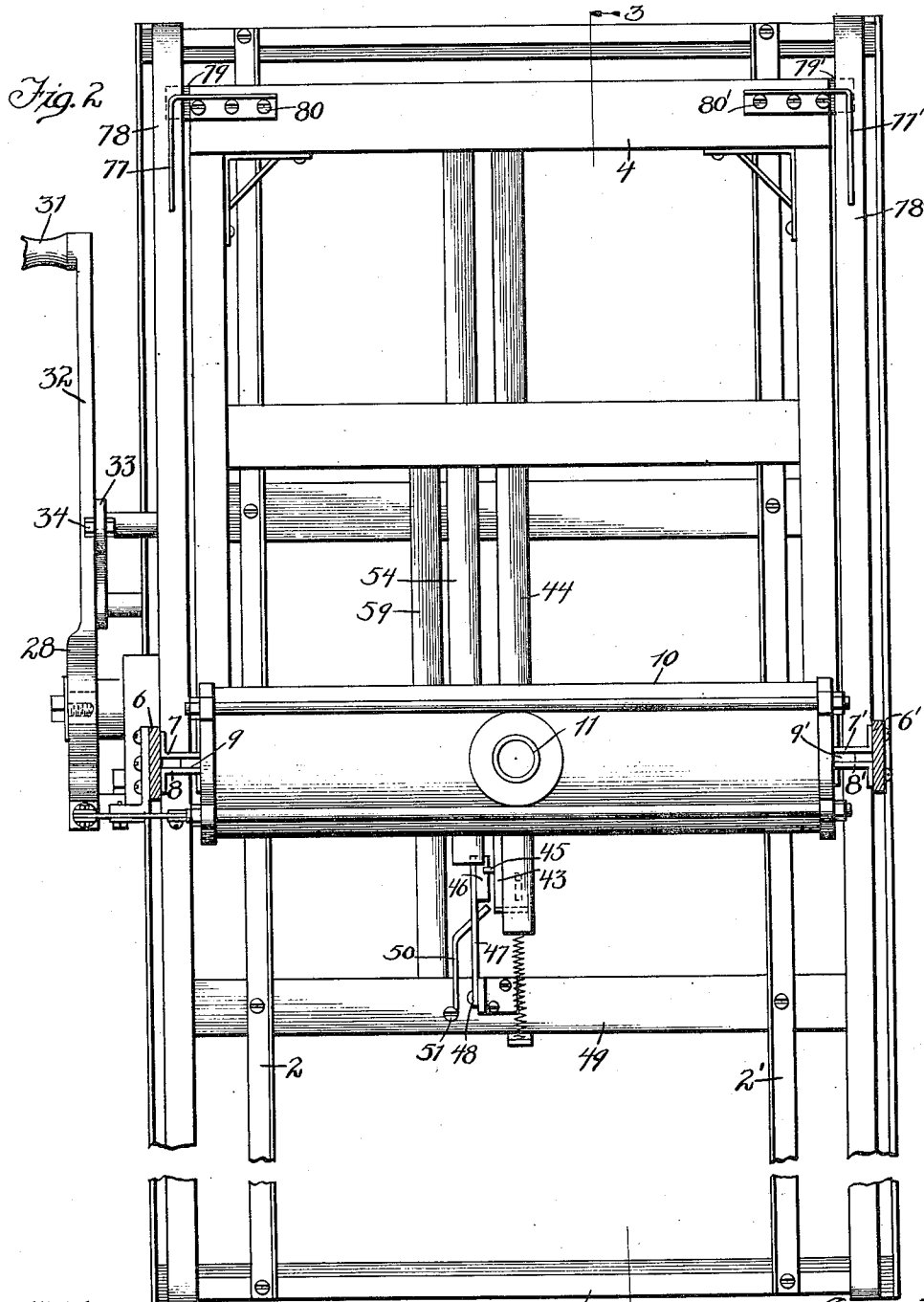
Inventor:
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4 SHEETS—SHEET 2.



Witnesses:
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4 SHEETS—SHEET 3.

Fig. 5.

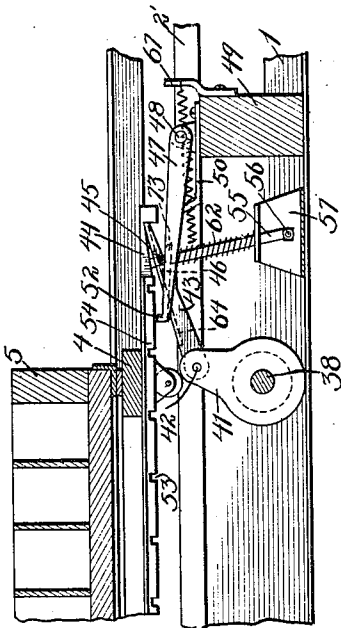


Fig. 3.

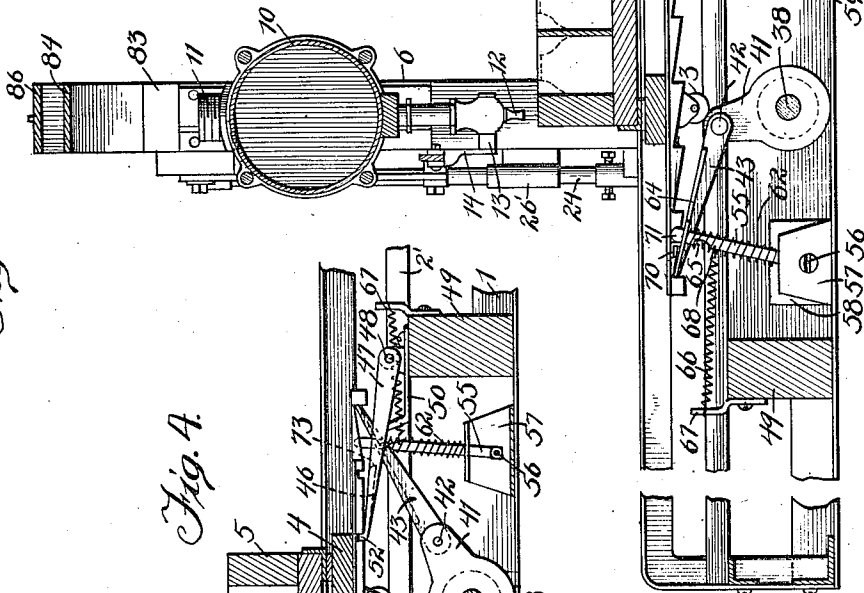
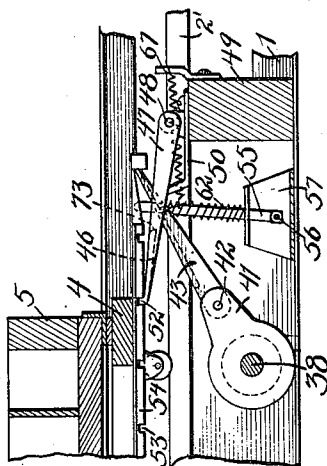


Fig. 4.



Witnesses:
J. D. Perry
Chas. H. Sem

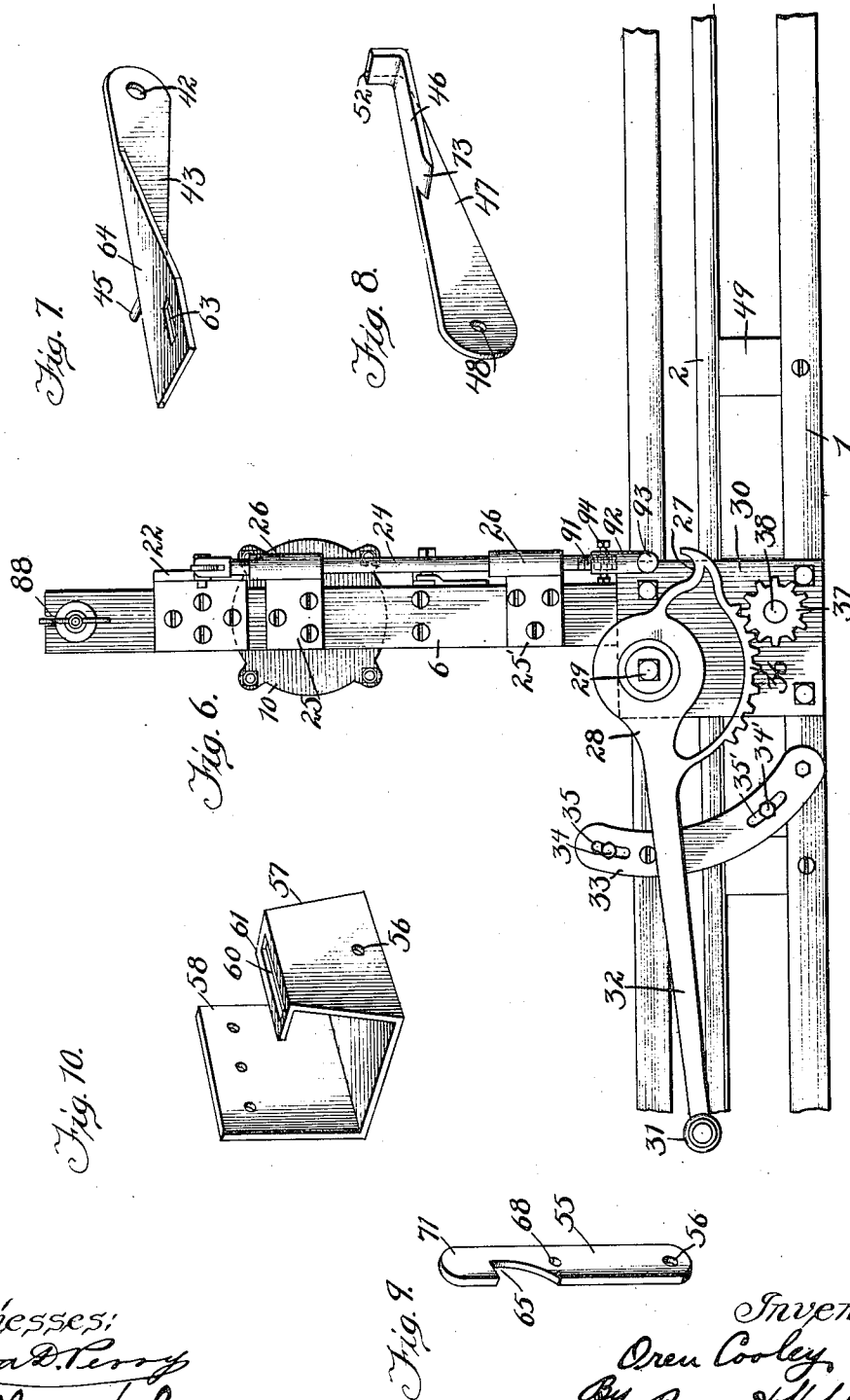
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4 SHEETS—SHEET 4.



Witnesses:
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Fig. 9

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UNITED STATES PATENT OFFICE.

OREN COOLEY, OF TORONTO, ONTARIO, CANADA, ASSIGNOR TO S. F. BOWSER & COMPANY, INCORPORATED, OF FORT WAYNE, INDIANA, A CORPORATION OF INDIANA.

BOTTLE-FILLING MACHINE.

1,015,995.

Specification of Letters Patent.

Patented Jan. 30, 1912.

Application filed November 13, 1908. Serial No. 462,449.

To all whom it may concern:

Be it known that I, OREN COOLEY, a citizen of the United States, residing at Toronto, Ontario, Canada, have invented certain new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

My invention relates to a bottle filling machine and one of its objects is the provision of an improved and efficient apparatus of this character.

A further object of the invention is the provision of means for efficiently filling bottles arranged in a plurality of rows.

The novel features of the invention will be described hereinafter where other objects of the invention will appear, and said novel features will be more particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is an end elevation view of my improved machine with a tray and guiding devices therefor in section; Fig. 2 is a plan view of the apparatus with the tray removed; Fig. 3 is a longitudinal sectional elevation taken on the line 3—3 of Fig. 2 looking in the direction of the arrows; Figs. 4 and 5 are fragmentary sectional elevations of the pawl and ratchet mechanism and the locking means taken on the line 4—4 of Fig. 1, looking in the direction of the arrows; Fig. 6 is a fragmentary side elevational view showing the left hand side of the apparatus represented in Fig. 1; and Figs. 7, 8, 9 and 10 are detail views.

1 designates a skeleton frame for supporting the various parts.

2, 2' designate fixed rails extending longitudinally and receiving the rollers 3, 3', connected to the bottom of the carriage 4 on which is placed the tray 5, the latter being adapted to contain a plurality of rows of bottles or other receptacles to be filled with liquid or other material.

6, 6' designate uprights which are connected at their lower ends to the sides of the frame work as indicated in Fig. 2. These uprights carry angle irons 7, 8 and 7', 8', spaced apart to form grooves for receiving the guide shoes 9, 9' which are connected to the respective ends or heads of the receptacle or tank 10 which is adapted to contain the liquid or other material with which the bottles are to be filled.

11 designates an opening through which

the liquid may be introduced into the tank 10 by gravity, by pressure or by pumping. If desired, the external portion of the material forming the opening 11 may be screw-threaded to receive a cap for closing the tank 10. Such cap may be provided with an eye by which the tank may be lifted into or out of its position between the uprights 6, 6'.

Connected to the lower portion of the tank 10 are a series of nozzles 12 corresponding in number to the number of bottles in each transverse row in the tray 5. These nozzles are each provided with a valve 13, which valves are connected by links 14 to a universal bar 16 to which is connected at 17 a link 18. To the outer end of this link is pivoted at 19 the lever 20 which in turn is pivoted at 21 to a bracket 22 fixed to the upright 6. To the outer end of the lever 20 is pivoted at 23 a push rod or bar 24 which, in this instance, is arranged in vertical position so as to slide up and down in the bearings 26, 26', which are respectively supported by brackets 25, 25' fastened to the upright 6. The lower end of the rod 24 is adapted to be engaged by the hollowed-out portion 27 of the lever 28 which is pivoted at 29 to the plate 30 mounted on the framework 1. It will be seen that the lever 28 is provided with a comparatively long arm 32 to which is connected a handle 31. The other arm of the lever having the recess 27 is comparatively short and it will be noticed in Fig. 6 that the short arm of the lever does not contact with the lower end of the rod 24 until the lever 32 is a comparatively short distance from the limit of its down stroke. The purpose of this lost motion connection will be explained hereinafter. Fastened to the frame 1 is a guide plate 33 provided with slots 35, 35' near the ends thereof, in which slots are adjustable the respective abutments 34 and 34', so that the initial and final positions of the lever 32 and the parts operated thereby may be varied as desired.

To the lower portion of lever 28 as viewed in Fig. 6 is connected a segmental gear 36 which meshes with a pinion 37 connected to rotate with a shaft 38. This shaft is mounted in bearings 39 and 40 as indicated in Fig. 1 and extends inwardly as indicated by the dotted lines and to the inner end of the shaft is connected a lever 41 as shown

in Figs. 3, 4 and 5. To the outer end of the lever 41 is pivoted at 42 a pawl 43 to cooperate with the ratchet teeth on the ratchet bar 44 connected to the under side of the carriage 4. In this instance this rack bar is connected to substantially the central portion of the carriage and extends longitudinally thereof, as indicated in Figs. 1 and 3.

10 The pawl 43 is provided with a laterally projecting pin 45 for engaging the flat cam surface 46 which extends laterally from a locking pawl 47. This locking pawl is pivoted at 48 to one of the cross pieces 49 of the framework and is pressed upwardly by the spring 50, which is fastened to the cross piece 49 at 51. The outer end of the locking pawl 47 is provided with a latch or catch 52 to fit in the recesses 53 of a locking rack 54 which is mounted on the under side of the carriage 4 adjacent the ratchet bar 44.

15 A latch lever 55 is pivoted at 56 to a frame or standard 57, which may be fastened to the framework by the vertical plate 58 indicated in Fig. 10. For this purpose the longitudinal strip 59 may be incorporated in the framework of the machine. To the standard 57 is connected a horizontal plate 61 provided with a slot 60 for guiding the latch lever 55 and also limiting its movement, if desired. Between the plate 61 and a laterally projecting plate 64 connected to the push pawl 43 is a spring 62. The upper end of the latch lever 55 extends through a slot 63 which is indicated in the detail view, Fig. 7. The latch member 55 is provided with a notch 65 a short distance from its upper end and a spring 66, connected at one end at 67 and at the other end to the lever 55 at 68, tends to move this notch to the left, as viewed in Fig. 3, so that when the cam 69 strikes the plate 64 the notch will ride over the outer end of the slot and hold the pawl 43 in depressed position out of engagement with the ratchet teeth 44, thus permitting free return of the carriage 4 to initial position. When the carriage reaches such position the striking device or projection 70 connected to the carriage 4 engages the upper end 71 of the lever 55 to unlock the latching device and permit movement of the carriage step by step. It will be noticed that the cam 69 is at or near one end of the carriage and that the striking device 70 is at or near the other end of the carriage. By this arrangement the carriage may be moved step by step to its final position where the cam 69 will effect the operation of the latching mechanism, so that the push pawl 43 will be rendered inoperative until the carriage is returned to initial position and the latching mechanism is unlocked by the projection 70.

As indicated in Fig. 3 the bottles shown by the dotted lines 74 may be fitted into

separate compartments formed by the partitions 75 in the usual manner and the tray 5 may be easily placed on or taken off the carriage 4 by grasping the tray through the lateral openings 76. The tray 5 is held in proper position at each corner by the right angle strips 77, 77' which extend over the longitudinal guide rails 78, 78' and may engage therewith or not, depending upon the height of the rails 2, 2' or the size of the rollers 3, 3'. Extending under the guide rail 78, 78' are retaining members 79, 79' which, with the right angle strips 77, 77', are fastened to the carriage 4 by any suitable means, screws 80, 80' being shown in this instance. It will be seen that the strips 77, 77' form with the retaining members 79, 79', respectively, guide shoes, fitting over the rails 78, 78' and compelling the carriage to move in a path determined by said rails. The frame work being shown closed at the ends as indicated in Fig. 2, the carriage cannot be removed unless the screws 80, 80' are loosened so that the retaining members 79, 79' may be removed. I may, however, leave the ends of the frame work open or provide one end thereof with a removable or hinged closure so that the carriage may be withdrawn entirely from the machine while the push pawl and the locking pawl are held out of engagement therewith. The removal of the carriage is desired when a tray of bottles of larger or smaller diameter are to be filled, as the length of the ratchet teeth must correspond to the diameter of the bottles in the tray.

To provide for bottles of different heights I may support the tank 10 at different elevations. This may be done in various ways but I have in this instance shown screws or pins 81, 81' inserted through the angles 7, 8, 7', 8' in alinement with the shoes 9, 9' at the ends of the tank. A series of such openings may be provided so that the tank may be supported at higher or lower levels. As indicated in Fig. 1 if the tank is to be at a higher position than that indicated, the same must be lifted, the screws or pins 81, 81' removed and inserted in the higher openings 82, 82'.

In order to reinforce the uprights 6, 6' I have provided a cross piece 86 to the center of which at 85 is connected the bracing member 84, the inner ends 83, 83' of which contact with the upper ends of the angles forming the grooves for the guide shoes at the ends of the tank 10. The outer ends of the cross piece 86 are provided with screw threaded bolts and by means of thumb nuts 87, 87' co-acting therewith the reinforcing frame may be fastened in position to the uprights. By loosening the thumb screws the reinforcing frame may be entirely removed and this is permitted by reason of slots 88 in the upper ends of the uprights,

as indicated in Fig. 6. After the reinforcing frame is removed the tank 10 may be lifted out of position after the spring 89 and the link 18 have been disconnected at 17 from the universal bar 16. A filled tank or one of different size or one having connected thereto a different number of nozzles may be substituted for the one removed and the spring 89 and link 18 again connected to the universal bar. It should be understood that it is desirable to have a different set of nozzles for each particular size of bottles if the diameters thereof are different. For instance, if the diameters are comparatively small, a large number of bottles may be placed in the tray and their respective mouths will be spaced apart only short distances and the nozzles must therefore be spaced apart correspondingly and should preferably be in number the same as the number of bottles of each row.

In some cases it may be desired to vary the throw of the universal bar 16 and I have therefore provided means for adjusting the length of the push rod 24. The lower end of the rod 24 is screw-threaded at 91 as indicated in Fig. 6 and fitting over this screw-threaded end is a cap extension 92, the lower end of which is rounded as indicated at 93 to better fit the recess 27. By turning the extension 92 in one direction or the other, the distance between the lower end 93 and the recess 27 may be varied and set screws 94 may be used to fasten the adjusting member in fixed position relatively to the rod 24.

I will now describe the operation of the bottle filling machine. The tank 10 being filled with liquid which is to be introduced into the bottles is placed in proper position at a height depending upon the height of the bottles. The uprights and the reinforcing cross frame combined with the guiding grooves and supporting pins hold the tank and the nozzles connected thereto in fixed position practically free from vibration. The angle irons forming the grooves for the shoes 9, 9', prevent the tank and nozzles from being tilted and the uprights connected by the cross pieces prevent endwise movement of the tank. After the spring 89 which is fixed to the upright 6' at 90 is connected at its other end to the universal bar and the link 18 is also connected thereto, the extension 92 at the lower end of the rod 24 may be adjusted to vary the throw of the universal bar, depending upon the size or kind of bottles used. A carriage provided with ratchet teeth of a length corresponding to the diameter of the bottles to be filled is placed in the machine and the guiding and retaining mechanism fastened in place by means of the screws 80, 80'. The tray containing the empty bottles may now be placed upon the carriage to fit with-

in the corner angle holders 77, 77'. Initially the tray and carriage occupy the position indicated in Fig. 3. Upon movement of the lever 32 away from the stop 34, motion is transmitted through the gearing 36, 37, and shaft 38 to the lever 41 and push pawl 43, so as to effect the movement of the carriage and the tray of bottles thereon. When the mouths of the bottles of the first row occupy a position directly beneath the respective nozzles, the latching projection 52 should slip into a notch 53 to hold the carriage and tray in such position. The initial position of the lever 32 may be varied by shifting the abutment 34 until this operation is obtained. At about the same time or in a short time after this locking of the carriage takes place the recess 27 of the short arm of the lever 28 should engage the lower end of the rod 24 so as to transmit motion to the universal lever bar 16 against the action of the spring 89. By adjusting the position of the abutment 34', the throw of the lever 32 may be variably limited so that the degree of movement of the valves may be varied. When the universal lever bar 16 is thus actuated, the valves are open and the liquid flows through the same into the bottles and when the latter are filled or partially filled the release of the handle 31 by the operator will permit the spring 89 to automatically close the valves 13 and cut off the flow of liquid through the nozzles.

When the lever 28 is returned toward initial position the pin 45 on the push pawl 43 will engage with the cam face 73 of the plate 46 which extends from the locking pawl 47 and depress the latter out of engagement with the locking rack against the action of the spring 50. The locking pawl is held out of such engagement during the remainder of the return of the lever 28 to initial position. The pin 45 will also hold the pawl 47 out of locking position when the operating lever is moved from initial position toward final position to move the carriage one step farther along to bring the next row of bottles under the nozzles and it is not until this is accomplished that the locking projection or latch 52 engages a notch 53. It should be observed that when the locking of the carriage takes place the lever 41 and push pawl 43 are substantially in alignment with each other so that any further rotation of the shaft 38 will not transmit any motion to the carriage but the push pawl 43 will be still held in engagement with the ratchet rack by the spring 62. This arrangement is preferred so that at or about the time that the locking takes place and no further movement of the carriage can be produced, the operating lever may be further actuated to open the valves of the nozzles. It will therefore be evident that I have pro-

vided apparatus for moving the rows of bottles into correct position for filling and holding them in such position while they are being filled. It will also be apparent that the entire apparatus may be operated at a single point by means of a single device, for by operating the lever 28 the carriage is first moved to correct position, then locked in such position and the valves opened until the bottles are filled. Upon moving the operating lever in the opposite direction the valves and the parts connected thereto are automatically restored to normal position and the connections between the operating lever and the moving means and locking mechanism are such that the latter also are restored automatically to correct position for the next operation.

When the last row of bottles have been filled and the operating lever is moved back to initial position, the flat plate 64 on the push pawl will engage the cam 69 and cause the pawl to be depressed until the notch 65 holds it against upward movement. This will be clear by reference to Figs. 3 and 7. The notch 65 is in such position that the pawl is held entirely out of engagement with the rack bar so that the carriage may be returned to initial position. When this occurs the striking device 70 engages the upper end 71 of the latch lever 55 and restores the push pawl to normal position ready for the next operation of filling another tray of bottles.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from the spirit and scope of my invention as defined by the claims and I wish therefore not to be restricted to the precise construction herein disclosed.

Having thus fully described my invention what I claim and desire to have protected by Letters Patent of the United States is—

1. In a bottle-filling machine, the combination with a movable carrier, of mechanism for moving said carrier to predetermined positions, automatic means for returning said carriage to initial position and means for rendering said moving-mechanism inoperative when the carrier reaches the limit of its stroke to permit the return of said carrier to initial position.

2. In a bottle-filling machine, the combination with a carrier, of mechanism for moving the same, automatically operated means for holding part of said moving mechanism inoperative when the carrier reaches the end of its travel and while the carrier is being returned to initial position, and an appliance for restoring said part to normal position upon the carrier reaching such initial position.

3. In a bottle-filling machine, the combination with a carrier, of apparatus for mov-

ing said carrier, mechanisms for locking said carrier in predetermined positions, automatic means for returning the carrier to initial position and appliances for automatically rendering both the locking mechanism and the moving apparatus inoperative during the return movement of the carrier.

4. In a bottle-filling machine, the combination with a carriage, of a ratchet rack connected thereto, a pawl, a spring pressing said pawl against said rack, mechanism for actuating said pawl to transmit motion to said carriage, a latch, an additional spring tending to move said latch in a predetermined direction, an extension from said pawl, a cam connected to said carriage at or near one end thereof to engage said extension to depress the pawl out of contact with said rack when the carriage reaches the limit of its travel to permit the return thereof to initial position, and a device at or near the other end of said carriage to unlock said latch and restore the pawl to operating position when the carriage reaches such initial position.

5. In a bottle-filling machine, the combination with a carriage, of a ratchet rack connected thereto, a push pawl engaging said rack, apparatus for actuating said pawl, a locking rack connected to said carriage, a locking pawl for engaging said last-named rack, and an extension from said push pawl for moving said locking pawl out of locking position.

6. In a bottle-filling machine, the combination with a carriage, of a ratchet bar connected thereto, of a push pawl cooperating therewith, apparatus for actuating said carriage, a flat lateral extension from said pawl, a latch member extending through a slot in said extension, a resilient device for holding said pawl in engagement with said ratchet bar, a cam at or near one end of the carriage for engaging said flat extension to depress the pawl until held by said latch member, a spring for moving said latch into locking position, and a member at or near the other end of said carriage for engaging said latch member to effect the restoration of said push pawl to operative position.

7. In a bottle-filling machine, the combination with a carriage, of a ratchet bar connected thereto, a push pawl, apparatus for actuating said pawl, a flat lateral extension from said pawl, a latch lever extending through a slot in said extension, a locking rack connected to said carriage, a spring-pressed locking pawl engaging said locking rack, a laterally extending flat cam on said locking pawl, a pin carried by said push pawl for engaging said flat cam to move or hold said locking pawl out of locking position, a spring tending to press said push pawl against said ratchet bar, a cam

at or near one end of the carriage for engaging said slotted extension to effect movement of both pawls out of engaging positions, an additional spring for operating the latch lever to hold said pawls out of such positions, and means at or near the other end of the carriage for unlatching said lever.

8. In a bottle-filling machine, the combination with a carriage, of a ratchet bar carried thereby, a push pawl, apparatus for actuating said pawl, a flat extension carried by said pawl, a latch lever extending through a slot in said extension, a guide plate in a plane substantially perpendicular to the plane of movement of said latch lever and having a slot through which the latter extends, and a spring embracing the lever between the said plate and said push pawl.

9. In a bottle-filling machine, the combination with a carrier, of a receptacle, a plurality of nozzles connected to said receptacle, a plurality of valves one for each of said nozzles, a universal member connected to said valves, means for actuating said member to operate the valves, and an appliance for adjusting said actuating-means to regulate the extent of movement of said valves.

10. In a bottle-filling machine, the combination with a carrier, of a receptacle, a plurality of nozzles connected to said receptacle, a plurality of valves one for each of said nozzles, a universal bar connected to said valves, apparatus for actuating said bar, and means for adjusting the throw thereof.

11. In a bottle-filling machine, the combination with a carrier, of a receptacle, a plurality of nozzles connected to said receptacle, a plurality of valves one for each of said nozzles, an actuating member, connections between said member and said valves, and means for varying the length of said actuating member.

12. In a bottle-filling machine, the combination with a carrier, of a receptacle, a plurality of nozzles connected to said receptacle, a plurality of valves one for each of said nozzles, a universal bar connected to said valves, a spring connected to said bar to hold said valves in closed position, a link connected at one end to said bar, a pivoted lever connected to the other end of said link, a rod connected to said lever, means for adjusting the length of said rod, and a device for actuating said rod, lever, link and bar to open said valves against the action of said spring.

13. In a bottle-filling machine, the combination with a carrier, of pawl and ratchet mechanism for moving the same, a lever for actuating said mechanism, and means for limiting the throw of said lever corresponding to the length of the ratchet teeth.

14. In a bottle-filling machine, the combination with a removable carrier, of ratchet teeth connected to said carrier and each of a length corresponding to the diameter of the bottles on said carrier, an actuating device, connections between said device and said ratchet teeth, and means for adjustably limiting the throw of said device according to the length of ratchet teeth in use.

15. In a bottle-filling machine, the combination with a carriage, of pawl and ratchet mechanism associated with said carriage, an actuating lever, a segmental gear and a pinion connected between said lever and said pawl-and-ratchet mechanism, and means for limiting the throw of said lever according to the length of the ratchet teeth.

16. In a bottle-filling machine, the combination with a carrier, of an actuating lever, connections between said lever and said carrier, a guide plate for said lever, and abutments movable in slots in said plate to variably limit the throw of said lever.

17. In a bottle-filling machine, the combination with a carriage, of pawl and ratchet mechanism for moving said carriage step-by-step, fixed guide rails, guide shoes associated with said rails, and fastening devices for said guide shoes capable of being loosened to permit a change of carriages with different length of ratchet teeth without a change of shoes.

18. In a bottle-filling machine, the combination with a carriage, of a tray on said carriage adapted to contain a plurality of rows of bottles, a filling receptacle, a plurality of nozzles connected thereto, means for controlling the flow through said nozzles, and mechanism for moving said carriage step-by-step to positions where the mouths of said bottles are directly under said nozzles.

19. In a bottle-filling machine, the combination with a carrier adapted to support a plurality of rows of bottles, of a filling receptacle, a plurality of nozzles corresponding in number to the number of bottles in each row, mechanism for controlling the flow from said receptacle, means for moving said carriage step-by-step to positions where the rows of bottles are respectively under said nozzles and temporarily locking said carriage in such position, and a lever for operating said moving and locking means and then said controlling mechanism to effect the filling of the bottles on the carrier one row after another.

20. In a bottle-filling machine, the combination with a carriage, of a tray on said carriage adapted to contain a plurality of rows of bottles, guiding devices for said carriage, a tank for containing liquid, a plurality of nozzles connected to said tank corresponding in number to the number of bottles in each row, a plurality of valves

one for each of said nozzles, a universal bar connected to said valves, a spring acting on said bar to hold said valves in closed position, pawl and ratchet mechanism for moving said carriage step-by-step to bring one row after another directly under said nozzles, means co-acting with said pawl and ratchet mechanism for locking the carriage while in such positions, an actuating member, direct connections between said member and said pawl and ratchet mechanism, and a lost motion connection between said member and said universal bar to delay the opening of said valves until the row of bottles to be filled is in correct position beneath the nozzles.

21. In a bottle-filling machine, the combination with a carriage, of a tray on said carriage adapted to contain a plurality of rows of bottles, a ratchet bar connected to said carriage, a spring-pressed push-pawl in engagement with the teeth of said ratchet bar, a notched locking bar connected to said carriage, a spring-pressed locking pawl, connections between said pawls to hold the locking pawl out of engagement with the locking bar while the carriage is being moved but permitting the carriage to be

locked in the position where the row of bottles to be filled is in a filling position, latch mechanism for rendering the said pawls inoperative during the return of the carriage to initial position, a cam for operating said latch mechanism to locking position, a striking device for unlatching said mechanism, a receptacle for containing the material with which the bottles are to be filled, a plurality of nozzles connected to said receptacle and corresponding in number to the number of bottles in each row, a plurality of valves one for each of said nozzles, an actuating lever, direct connections between said lever and said push-pawl, and a lost-motion connection between said lever and said valves to delay the opening of the latter until after the carriage reaches bottle-filling position and is locked temporarily in such position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 4th day of November, A. D. 1908.

OREN COOLEY.

Witnesses:

LERO SWARTZ,
B. M. PREDAM.