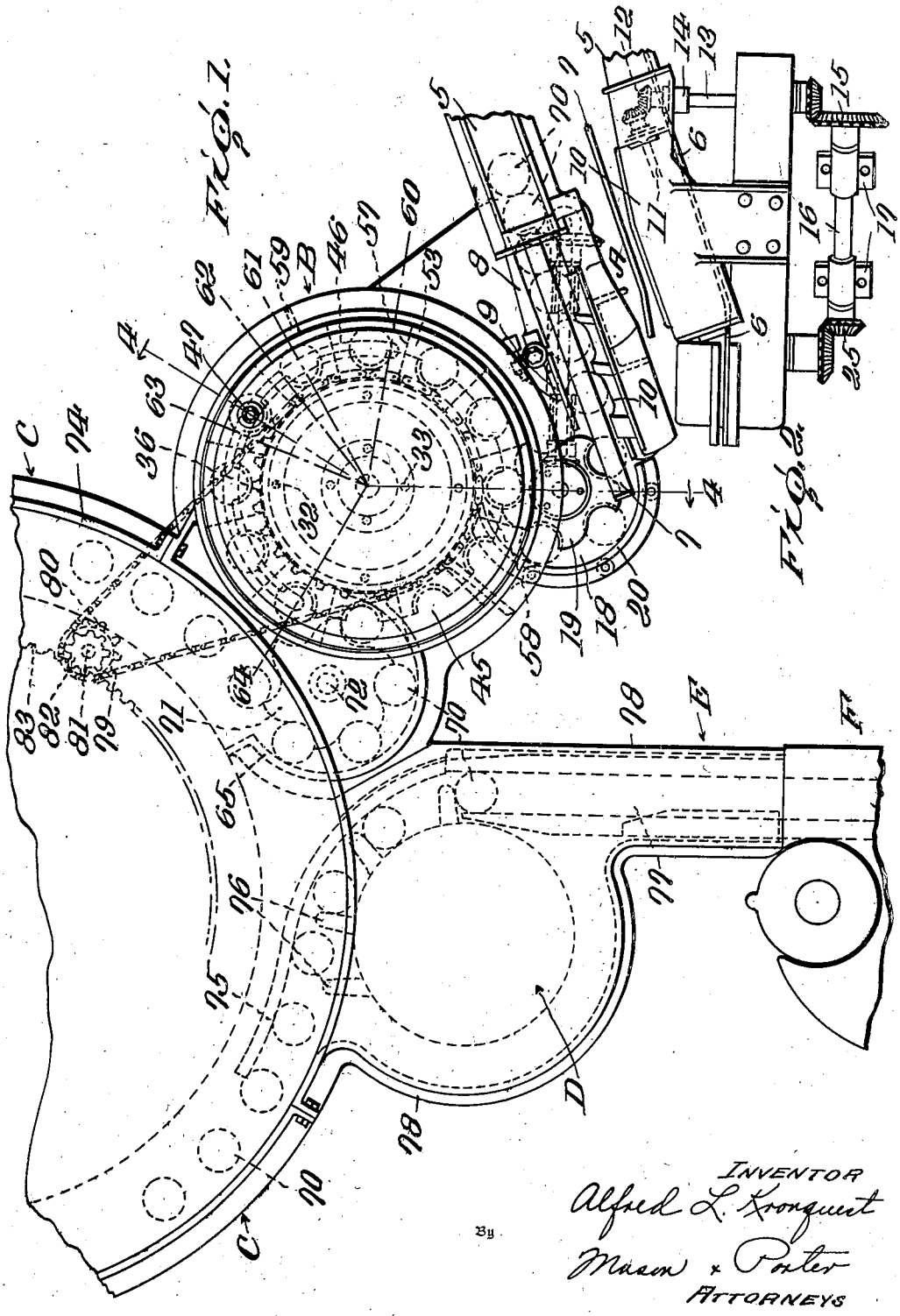
Nov. 11, 1941. A. L. KRONQUEST 2,262,685

APPARATUS FOR GASSING CONTAINERS PRIOR TO FILLING THEREOF

Filed Dec. 7, 1939 7 Sheets-Sheet 1



INVENTOR
Alfred L. Kronquest
By Mason & Porter
ATTORNEYS

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APPARATUS FOR GASSING CONTAINERS PRIOR TO FILLING THEREOF

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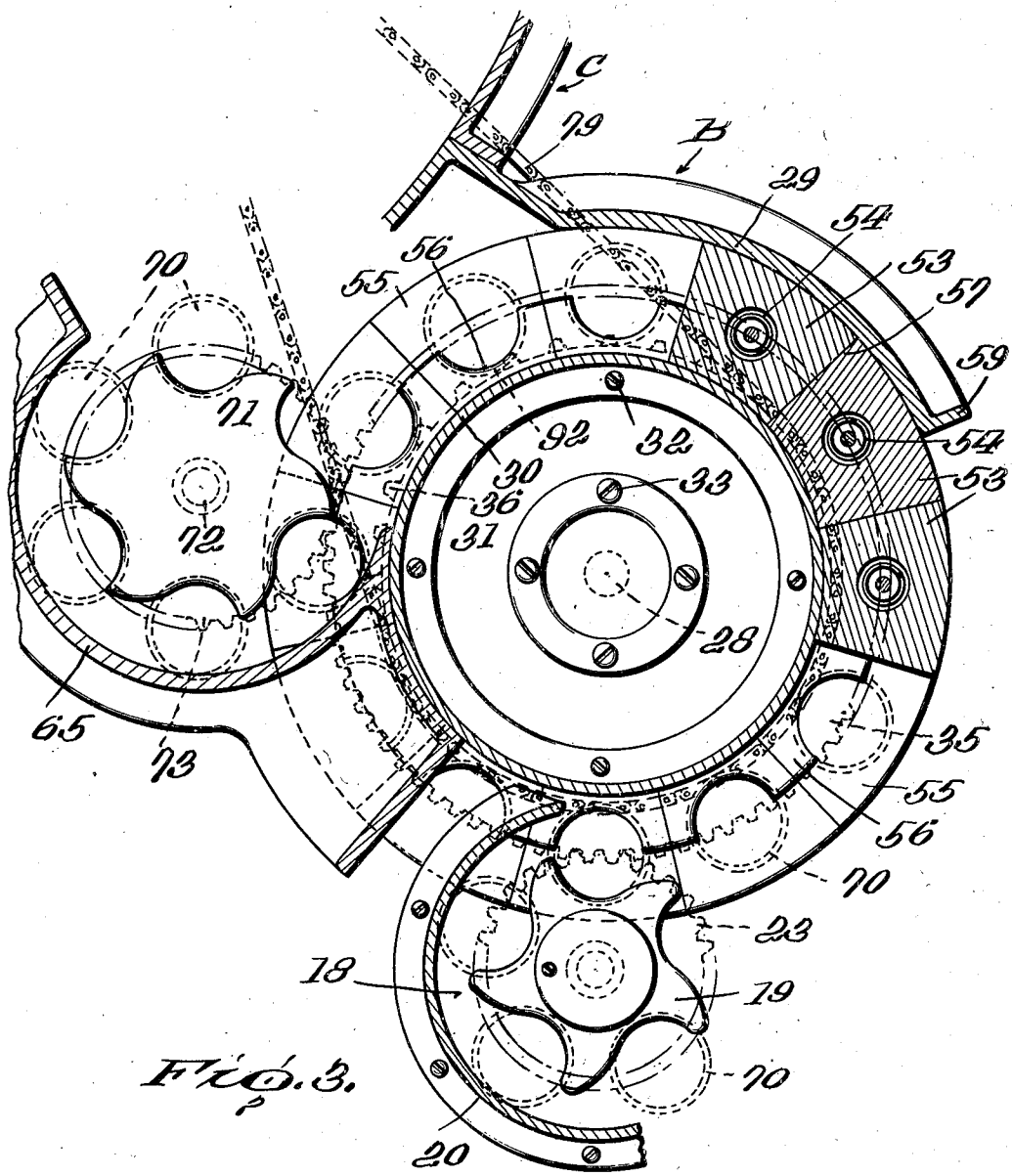


FIG. 3.

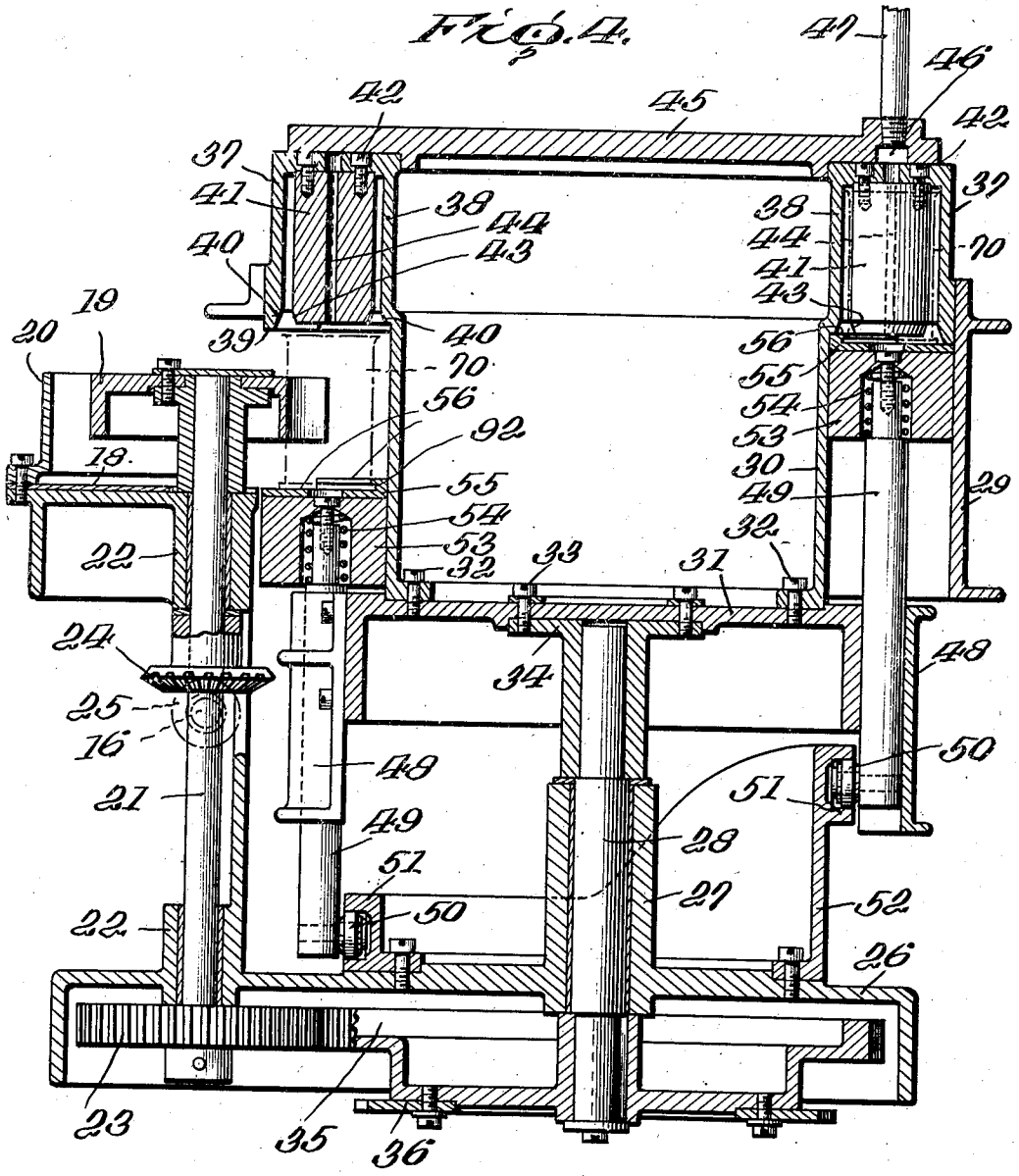
INVENTOR
Alfred L. Kronquest
By Mason & Porter
ATTORNEYS

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Fig. 4.



INVENTOR
Alfred L. Kronquest
By Mason, Porter
ATTORNEYS

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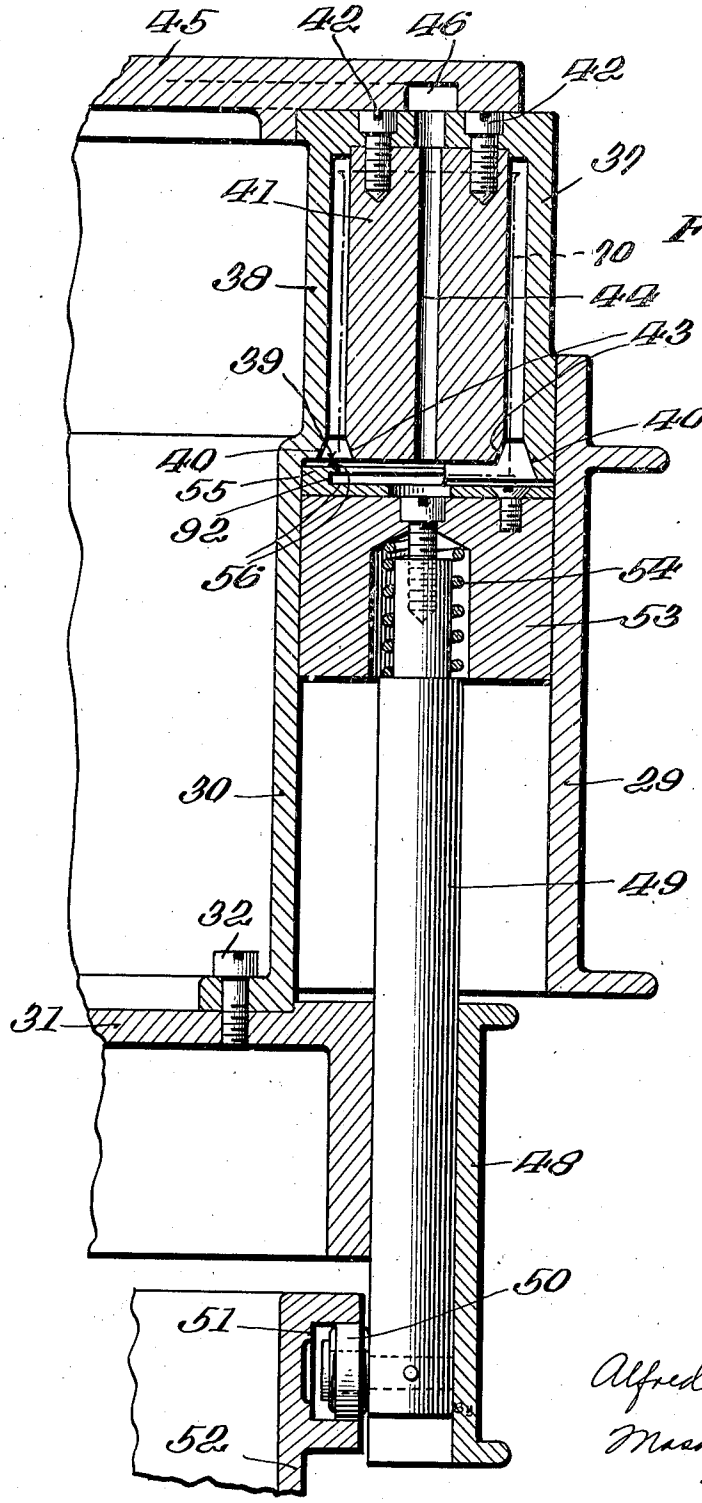


FIG. 5.

INVENTOR
Alfred L. Kronquest
Mason & Porter
ATTORNEYS

Nov. 11, 1941. A. L. KRONQUEST 2,262,685

APPARATUS FOR GASSING CONTAINERS PRIOR TO FILLING THEREOF

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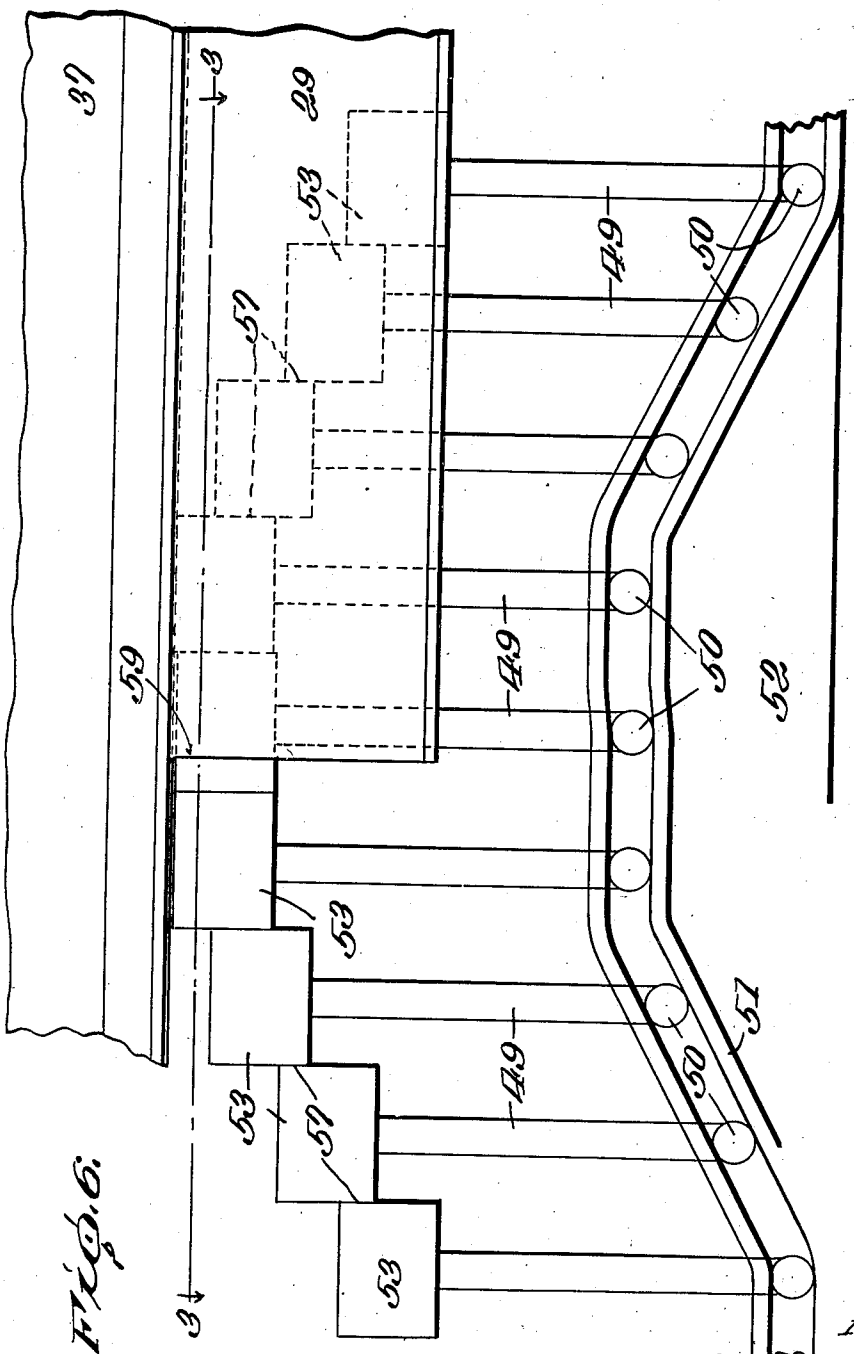


FIG. 6.

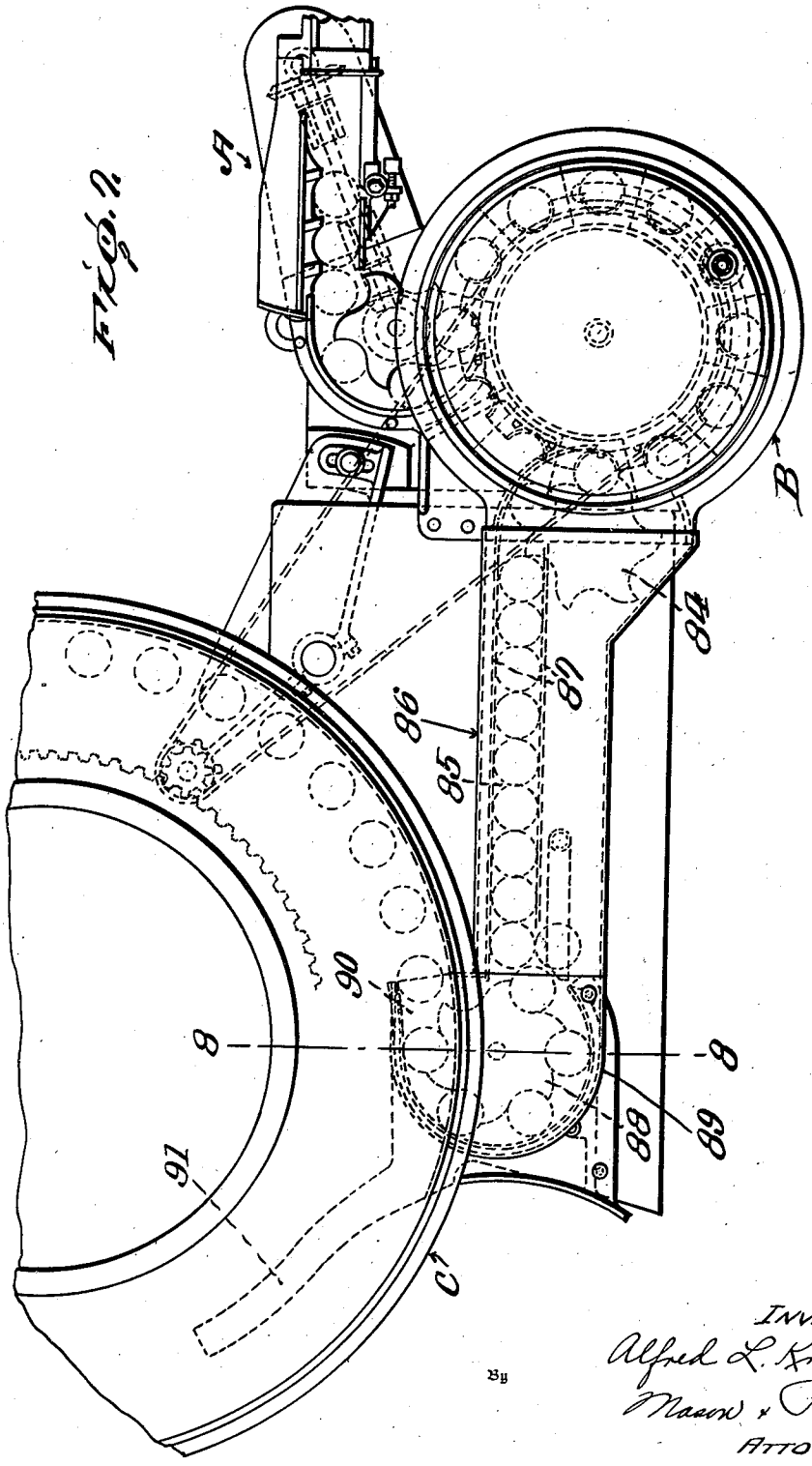
INVENTOR
Alfred L. Kronquest
By Mason & Porter
ATTORNEYS

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APPARATUS FOR GASSING CONTAINERS PRIOR TO FILLING THEREOF

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Fig. 2.



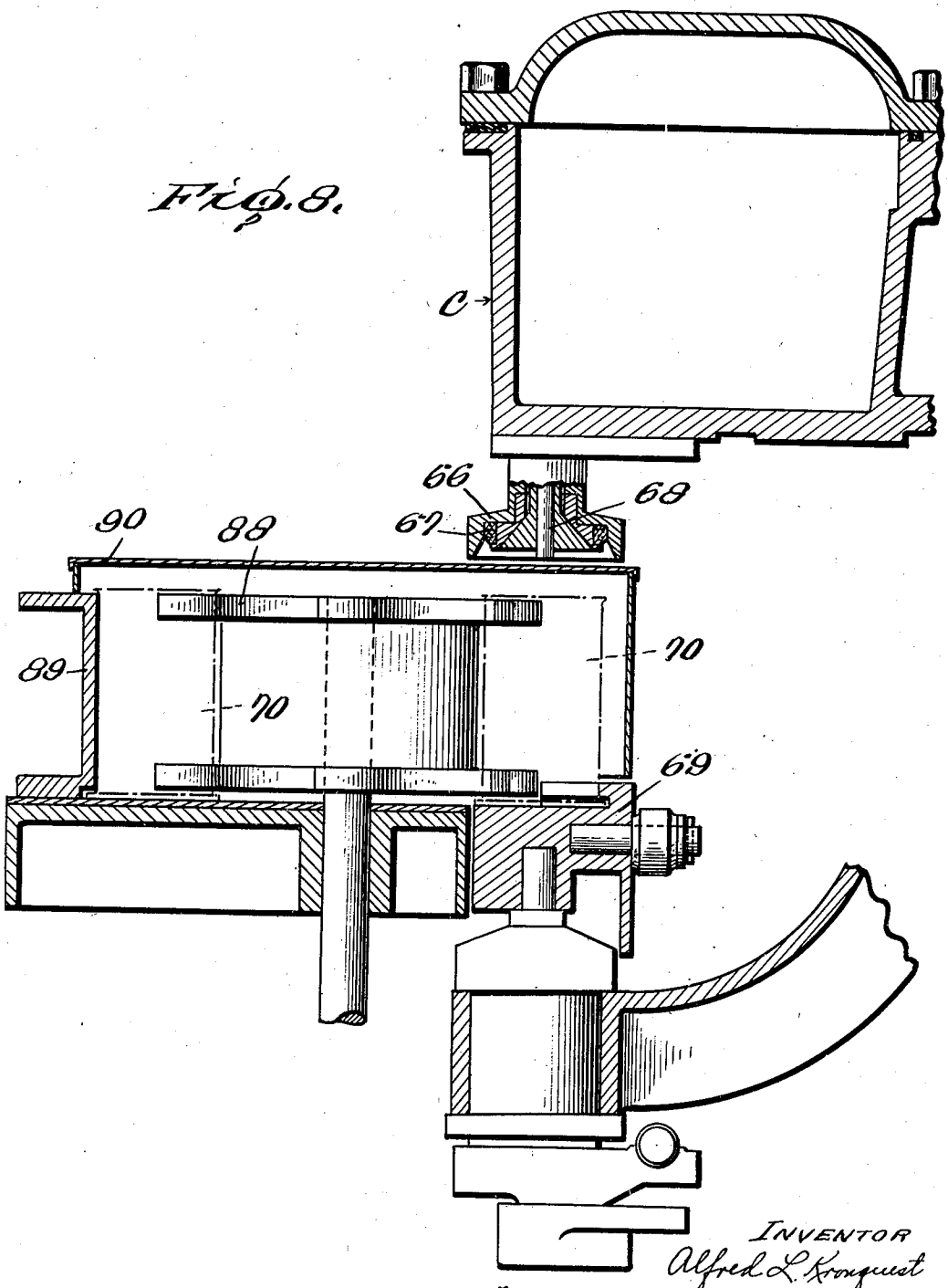
INVENTOR
Alfred L. Kronquest
By Mason & Porter
ATTORNEYS

Nov. 11, 1941. A. L. KRONQUEST 2,262,685

APPARATUS FOR GASSING CONTAINERS PRIOR TO FILLING THEREOF

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Fig. 8.



INVENTOR
Alfred L. Kronquest
By Mann & Porter
ATTORNEYS

Patented Nov. 11, 1941

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UNITED STATES PATENT OFFICE

2,262,685

APPARATUS FOR GASSING CONTAINERS PRIOR TO FILLING THEREOF

Alfred L. Kronquest, Syracuse, N. Y., assignor to Continental Can Company, Inc., New York, N. Y., a corporation of New York

Application December 7, 1939, Serial No. 308,092

14 Claims. (Cl. 226—68)

The invention relates generally to the art of filling and closing portable receptacles and primarily seeks to provide a novel apparatus for effecting displacement of air from containers about to be filled and the replacement of the air with an inert air excluding gas.

It has long been recognized as desirable to remove air from containers into which products are to be filled and preserved, and this is particularly true with respect to certain beverages of which beer forms an example. It has been found that air in containers filled with beer has a tendency to cause the beer to deteriorate and be objectionably affected as to both color and taste. For this reason various means have been employed in attempts to eliminate air from the containers during the packaging of beer and similar products. Attempts have been made to withdraw air from the containers after they are filled and before they are closed by the drawing of a vacuum in the head spaces of the containers, or by blowing air out of said head spaces by cross directed jets, but these methods of accomplishing the desired end are objectionable because of tendencies to cause the beer to be displaced by rapid withdrawal of air from the body thereof or by force jet contact. Other methods of displacing air from containers have been attempted in one of which the air is displaced by directing gas into the containers through a tube projected into the containers so that the gas is discharged adjacent the bottoms thereof, but such methods have been found objectionable because of adulteration due to admixture of the air with the gas directed into the containers. Such methods also have been found objectionable because of re-adulteration by introduction of air during the transfer of the gassed container from the gassing mechanism to the filling mechanism. Therefore, the invention has for an object to provide a novel apparatus for definitely displacing the air from containers and substantially totally replacing that air either in a manner for assuring against adulteration by air inclusion or re-adulteration by introduction of air prior to filling and closing.

In its more detailed nature the invention resides in the provision of novel means for mechanically displacing air from the containers by introduction thereinto of a solid walled body shaped and sized to substantially fill the container, and means effective, while retaining the body in the container, for forcing a gas into the bottom of the container for the purpose of forcibly expelling air not displaced by the solid, and means for removing the body while continuing the introduction of gas so that air will be totally displaced from the container and totally replaced by the gas.

Another object of the invention is to provide means for introducing an air displacing plug into each container to be filled, each said plug being of a size and shape for displacing substantially all air from the container into which it is introduced but which is spaced slightly from the container at the bottom and sides of the container, and means for introducing gas at the bottom of the spacing thus provided for displacing air from said spacing, and means for continuing the introduction of gas while removing the plugs from the respective containers so as to wholly fill the containers with gas.

Another object of the invention is to provide an apparatus of the character stated in which is included a rotary turret including a gassing chamber and a plurality of vertically reciprocable chamber sealing supports onto which containers are individually fed and which serve to lift the containers into air displacing plug-receiving positions and for again lowering said containers to effect relative withdrawal movement between the plugs and the containers during introduction of gas into the containers.

Another object of the invention is to provide a turret of the nature stated, and means for individually lifting and lowering the individual container supports through two stages, in the first stage of which said support is left spaced from the gassing chamber to permit expulsion of air by introduction of gas into the bottoms of the containers around the plugs, and in the second stage of which each said plug serves to seal the gassing chamber against ingress of air.

Another object of the invention is to provide novel means for sealing containers against ingress of air following the withdrawal of the air displacing plugs therefrom and prior to introduction of the containers into a filling mechanism.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings—

Figure 1 is a somewhat diagrammatic plan view illustrating the invention mounted in cooperative relation with a container filling machine and a container closing machine.

Figure 2 is a fragmentary side elevation illustrating the means for feeding the containers to the gassing unit.

Figure 3 is a horizontal section of the container gassing unit, the section being taken substantially on the line 3—3 on Figure 6.

Figure 4 is a vertical cross section taken on the line 4—4 on Figure 1.

Figure 5 is an enlarged fragmentary cross sectional view illustrating completion of the step of expelling air from a container by introduction of gas thereinto.

Figure 6 is a diagrammatic partial development of the container supporting block lifting and lowering cam and illustrates the relative positions of container supporting blocks being lifted and lowered thereby.

Figure 7 is a view similar to Figure 1 and illustrates a slightly modified arrangement of the invention.

Figure 8 is a fragmentary vertical cross section taken on the line 8—8 on Figure 7.

The apparatus herein disclosed in illustration of the invention includes a feed-in mechanism generally designated A, the air displacing and gassing unit B, a rotary turret filling machine C, and a suitable accelerating disk and feed-away equipment D for transferring the filled containers from the filling machine through a transfer-way E to the closing machine generally designated F. The empty containers fed into the apparatus by the mechanism A have the air contained therein displaced and supplanted by CO_2 gas in the unit B, after which they are filled with beer or other beverage or product and are delivered through the feed-away equipments D and E into the closing machine F wherein they have end closures secured thereon in the usual manner. See Figure 1. It is to be understood that following the displacement of air from the empty containers and the gassing thereof, the containers are maintained in a CO_2 gas atmosphere at all times when they are out of actual contact with the filling mechanisms which serve to seal the mouths or open tops thereof so that ingress of atmospheric air into the head spaces of the containers or the product therein prior to sealing of the containers is prevented.

The feed-in mechanism A includes a can-run-delivery-way 5 which delivers onto a supporting rail 6 and in passing over the rail 6 the empty containers move beneath a top rail 7 and between suitable confining side guides. At one side there is provided a guide rail 8 which includes an adjustably mounted end wall portion 9, and at the other side of the feed-way the empty containers are opposed by a feeding and timing screw 10. The screw 10 is rotatably supported as at 11 and is driven through the medium of a gear couple 12 from a driver shaft 13 rotatably supported as at 14 and which is in turn driven through a gear couple 15 from a driver shaft 16 disposed beneath the level of the screw in suitable bearings 17.

From the floor 18 onto which the empty containers are delivered from the feed-way 6, 7, 8, 10, said containers are transferred by a star wheel 19 into the air displacing and container gassing unit B, suitably guided by the arcuate confining wall 20. See Figures 1, 2 and 4.

The star wheel 19 is secured upon the upper end of a vertically disposed shaft 21 rotatably mounted in frame bearings 22 and which carries a spur gear 23 at its lower end and a bevel gear 24 intermediate its ends. The bevel gear 24 meshes with a bevel pinion 25 secured upon the shaft 16 and by this means rotation is imparted from the shaft 21 to the shafts 16 and 13 and the feed-in timing screw 10. See Figures 2 and 4.

The unit B includes a stationary frame including a base portion 26 provided with a central vertically disposed bearing 27 within which the turret shaft 28 is rotatably mounted, and a casing shell 29 within which the turret rotor shell 30 is rotatable. The rotor shell includes a base plate 31 to which the shell is secured as at 32, the base plate being in turn secured as at 33 upon a driving head 34 fixed upon the upper end of the shaft 28. At its lower end the shaft 28 carries a spur gear 35 which meshes with the spur gear 23 and serves to impart rotation to the shaft 21 on which said last named gear is mounted. The gear 35 carries a sprocket 36 to which rotation is imparted in a manner later to be described. See Figure 4.

The turret rotor shell includes an enlarged head portion 37 at the upper extremity thereof, and it will be observed that this enlargement extends a considerable distance beyond the cylindrical lower portion or skirt of the rotor. The head portion is provided with a plurality of vertical cylindrical bores 38 disposed in equidistantly spaced relation about the axis of the rotor and which serve to form gassing chambers. In this particular illustration 12 such bores are shown, but it is to be understood that the number can be increased or diminished to suit particular demands of use. The bores are closed at their upper ends and they open at their lower ends through a horizontally disposed, concentrically stepped wall 39. The lower ends of the bores are flared as at 40 for a purpose that will later become apparent.

A solid walled plug 41 is secured at 42 to the top or ceiling of the head portion 37 of the rotor and depends in concentric relation within each bore so as to confine the gassing chamber formed within the bore to a relatively narrow annular space. The lower extremity of each plug is tapered as at 43 and terminates flush with the uppermost stepped portion of the wall 39. Each plug 41 also includes a central bore 44 which registers with a bore formed in the top or ceiling of the head portion 37, thus forming a passageway through the plug communicating with the gassing chamber at a point below the plug and with the space above the head portion 37 through the bore provided in that portion.

The head portion has a snug moving fit in the upper end of the casing shell 29 and in a recess formed in the under surface of a head plate 45 rigidly secured to the machine frame or any suitable rigid support. The head plate is equipped with an arcuate recess 46 in its under surface which is concentric with the axis of the turret and is of a length for extending over or spanning approximately six of the gassing chambers or bores 38 in the turret rotor. This recess is connected by a pipe line 47 with any suitable source of CO_2 gas under pressure (not shown).

The base plate 31 includes a depending edge skirt portion to which a plurality of bearing members 48 are removably secured. A bearing member 48 is provided for each of the gassing chambers and each such member is disposed in axial alignment beneath one of the chambers. In each bearing member 48 a rod 49 is reciprocably mounted, and each rod carries an actuator roller 50 which rides in a grooveway 51 in a cam

shell 52 secured upon the base frame portion 26. At its upper end, each rod 49 carries a supporting pad or base block 53. Each block 53 is yieldably mounted as at 54 upon its supporting rod and has its head portion equipped with a replaceable wear plate 55, the upper surface of which is step-faced as at 56 and has a snug moving fit with the stepped wall 39 defining the lower terminus of the head portion 37 of the turret rotor. The inner and outer surfaces of the blocks 53 have a snug moving fit in the opposed concentric wall portions of the rotor shell 30 and the casing shell 29, and the end surfaces of the respective blocks engage in snug moving fit as at 57. Thus the blocks engage in gas sealing contact with each other and with the opposed turret rotor and casing shell portions. See Figures 1 and 6.

The casing shell 29 is provided with an opening which extends from the point 58 at which the empty containers are fed onto the supporting blocks 53 of the turret around to the point indicated at 59. Around substantially the whole of the remainder of the turret, or from a point just beyond the opening terminus at 59 onward, the mutual contact relation of the blocks 53, the turret rotor and the casing shell serve to seal the gassing chambers or bores 38 against egress of CO_2 gas or ingress of air. See Figures 1 and 6.

The cam groove 51 is so shaped that the uppermost or container supporting surfaces of the blocks 53 are presented at the level of the floor 18 at the container receiving station, and from that point on the cam groove rises so that an upward movement will be imparted to each block and the empty container thereon until the block reaches the point indicated at 60, at which time the uppermost surface of the block will have been elevated until it is spaced only a slight distance from the stepped wall 39 of the head portion. See Figures 1, 5 and 6. This spacing is preferably limited to $\frac{1}{32}$ of an inch and the cam groove includes a dwell portion which causes this slightly spaced relation of the parts to pertain at the point indicated at 60 to the point indicated at 61 or a distance slightly greater than twice the diameter of one of the gassing chambers or bores 38. The gassing port or recess 46 extends to the point designated 60 and it will be obvious that while each block is held slightly spaced from the under surface or stepped wall bottom 39 of the head portion 37 throughout the interval stated, CO_2 gas will be forced through the respective plug bore 44 into the lower extremity of the empty container and up through the very small annular space intervening the respective plug 41 and said container, thereby serving to expel all air from the container and force it downwardly through the confined annular space surrounding the container within the cooperative bore 38 and out through the space intervening the respective block and the head portion and the lateral opening in the casing shell 29. See Figure 5. By this means all air is expelled from each container as it is being moved through that portion of the turret travel intervening points designated 60 and 61.

Following the point designated 61, the cam groove includes a slight lift portion and serves to lift the respective block while passing from the point designated 61 to the point designated 62, at the latter of which points the blocks will have been raised and yieldably pressed into sealing contact with the under surface or stepped wall 39 of the head portion 37. See Figures 4 and 6. The cam groove is so shaped that this contact pertains from the point designated 62 to the point designated 63, and following this point the cam groove serves to lower the blocks and return them to the initial, container receiving level hereinbefore referred to. This lowering of the blocks commences at the point designated 63 and is completed at the point 64, and it will be observed that the gassing port or recess 46 terminates at the point 64. While the blocks are being lowered in passing between points 63 and 64 they effect a lowering of the container supported thereon and from which all air has been expelled by forced introduction of CO_2 gas, and it will be observed that during the lowering of these containers, the CO_2 gas continuing to enter through the port or recess 46, will fill the containers and replace air previously contained therein. This inrushing of gas also serves to fill the chamber space formed beneath the chambers 38 by the gradually increased volume occasioned by the lowering of the blocks.

The turret shell or casing is attached to the frame of the filling machine generally designated C and the head portion or filling section of this machine preferably is encased with a gas trapping wall or housing generally designated 65 so that the area surrounding the filling spouts of the filling machine will contain a CO_2 gas atmosphere serving to exclude atmospheric air. It is to be understood that the filling machine with which the invention is combined or connected in cooperative relation may be of any approved type of the many forms of such machines which include filler spouts 66 equipped with sealing rings 67, filler tubes 68, and vertically reciprocable supports or pads 69 which individually receive the gassed containers from the turret hereinbefore described and lift them into sealing contact with the sealing ring equipped spouts.

The gassed containers indicated at 70 are transferred from the supporting pads of the gassing turret by a star wheel 71 secured upon the upper end of a vertical shaft 72 driven as is the star wheel 19 by a gear couple 73 with the turret gear 35. The filling machine may include a gas confining housing portion 74, and since the containers are delivered directly from the star wheel onto the receiving pads of the filling machine which are promptly elevated to force the open upper ends of the containers into tight contact with the filling spout within an atmosphere of CO_2, the filling operation immediately succeeds the complete substitution of CO_2 gas for the atmospheric air previously contained in the containers and aeration of the beverage and inclusion of air in the head spaces of the containers above the filled beverage is avoided.

Following the filling of the containers, the filled containers are stripped from the supporting pads of the filling machine by a stripper wall 75 and are engaged by the feeder fingers 76 of the accelerating disk D and transferred by any suitable conveying means over a feedway 77 into the closing machine generally designated F. In passing from the filling machine to the closing machine the filled containers pass through a CO_2 gas confining housing 78 and are thus presented to the closing devices without possibility of adulteration of the beverage with atmospheric air or introduction of said air into the head spaces overlying the filled beverage. It is to be understood that the closing machine generally designated F may be of any approved type.

Rotation is imparted to the turret through the medium of a driver chain 79 which takes over

the turret sprocket 36 and over a sprocket 80 mounted on a shaft 81 which carries a pinion 82 enmeshed with a ring gear 83 movable with the filling machine turret.

In operation, the air filled containers are fed one by one onto the supporting blocks 53 of the gassing turret. In moving from the position at which a container is received thereon to the point designated 60, each block is elevated until it comes within approximately 1/32 of an inch from contacting the stepped wall or bottom 39 of the head portion 37. While the block is passing from the point 60 to the point 61, during which period it will remain spaced below the head portion in the manner stated, CO_2 gas will be forced into the bottom of the container and about the outer solid wall surface of the respective plug serving to expel the small amount of air which has not been displaced by the introduction of the plug into the container during its movement to the point 60. See Figure 5.

As the supporting blocks lower the containers 70 and bring about a withdrawal of the plugs therefrom while the blocks are passing from the point 62 to the point 63, the gas continuing to flow from the lower end of the plug will completely fill the container and the space above the block with CO_2 gas. The containers thus excluded of all air content and filled with CO_2 gas are transferred to the filling machine where they are filled with liquid without ingress of atmospheric air in the manner hereinbefore described. It is to be understood that the under surface of the casing or housing portion of the turret intervening the star wheel 71 and the receiving station at which the empty containers are presented to the supporting blocks is concentrically stepped in the same manner as is the stepped wall 39 of the turret head portion 37 so as to engage in gas sealing contact with the upper concentrically stepped surfaces 56 of the supporting blocks 53. Following the filling of the containers they are delivered to the closing machine through the housing equipments 78 which enclose a CO_2 gas atmosphere and assure delivery of the containers to the closing mechanisms without ingress of atmospheric air.

In Figures 7 and 8 of the drawings, I have illustrated a slightly modified arrangement of the invention in which the infeeding unit A and the air excluding and gassing unit B function in the manner previously described. In this adaptation of the invention the star wheel 84 delivers the gassed containers from the turret B onto a suitable feed conveyor 85 in a CO_2 gas atmosphere confining tunnel 86 having lateral guideways 87 therein and which delivers the gassed containers to a star wheel 88 within a CO_2 gas atmosphere confining housing 89 including a hood portion 90 extending inwardly over the containers 70 being transferred to the filling machine and beneath the filling spouts 66 of the filling machine. In the previously described form of the invention the gassed containers were delivered directly from the gassing turret B to the filling machine but in this modified disclosure, it will be noted that they are indirectly fed through a CO_2 gas atmosphere confining tunnel which permits a spaced relation between the gassing turret B and the filling machine C. After the gassed containers are filled they may be stripped from the supporting pads of the machine by a suitably positioned stripper bar 91 and delivered to the closing machine in the manner hereinbefore described.

By proportioning the container receiving chambers or bores 38 and the solid walled plugs 41 in the manner herein described, annular spaces of very limited area are provided between the plug and the inner walls of a container and between the outer walls of the containers and the inner walls of the chamber when a container is positioned in said chamber, and by introducing the CO_2 gas under pressure centrally of the plug and at the extreme bottom of the container, a very efficient driving out of air from the small space surrounding the plug is provided for. It will be obvious also that the major portion of the air displaced from the containers is displaced by mere introduction of the solid walled plugs 41 into the containers. It will be obvious also that because of the close spacing of the parts referred to, and because of utilizing the gas to expel the remaining air while the blocks 53 are spaced only slightly below the stepped wall or bottom portion 39 of the head portion 37, the driving out of air is accomplished with a minimum loss of gas.

The upper stepped portion of each of the supporting blocks 53 preferably is undercut as at 92 for receiving the bottom seam of the containers. This undercut stepped portion serves to suitably center the containers as they are fed onto the blocks at the receiving station and also facilitates withdrawal of the containers from the annular gassing chambers as the blocks are lowered. It will be obvious that as each block is elevated to present a container in the annular gassing chamber, the flared and tapered surfaces of the rotor head and plug structures respectively designated 40 and 43 will facilitate entrance of the containers into said chambers and round up any containers which might be out of round.

It is of course to be understood that the details of structure and arrangement of parts may be variously changed and modified without departing from the spirit and scope of my invention.

I claim:

1. In apparatus of the character described, a support for an empty container, means for forming a confining chamber about a container on the support, a solid walled plug of a size for substantially filling a container, means for bringing about relative movement between the support and the plug for causing the latter to enter a container on the support and displace substantially all air from the container and then withdraw from said container, and means for directing a gas into said container to replace the air displaced therefrom.

2. In apparatus of the character described, a support for an empty container, means for forming a confining chamber about a container on the support, a solid walled plug of a size for substantially filling a container, means for bringing about relative movement between the support and the plug for causing the latter to enter a container on the support and displace substantially all air from the container and then withdraw from said container, said plug having a bore therethrough for communicating with the interior bottom portion of a container, and means for directing a gas through the plug bore into said container before withdrawal thereof for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of said plug for replacing with gas all air displaced from the container.

3. In apparatus of the character described,

a support for an empty container, means for forming a confining chamber about a container on the support, a solid walled plug of a size for substantially filling a container, means for bringing about relative movement between the support and the plug for causing the latter to enter a container on the support and displace substantially all air from the container and then withdraw from said container, said plug having a bore therethrough for communicating with the interior bottom portion of a container, means for directing a gas through the plug bore into said container before withdrawal thereof for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of said plug for replacing with gas all air displaced from the container, a container filling machine, a container closing machine, and means for delivering the gassed container to the filling machine and from the filling machine to the closing machine in an inert gas atmosphere.

4. In apparatus of the character described, a support for an empty container, a body having a bore therein forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug of a diameter only slightly less than the internal diameter of containers to be gassed in said chamber, said plug having a bore therethrough for communicating with the interior bottom portion of a container, means for bringing about relative movement between the support and the plug for causing the latter to enter a container on the support and displace air therefrom and then withdraw from said container, and means for directing a gas through the plug bore into said container before withdrawal thereof for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of said plug for replacing with gas all air displaced from the container.

5. In apparatus of the character described, a support for an empty container, a body having a bore therein forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug of a diameter only slightly less than the internal diameter of containers to be gassed in said chamber, said plug having a bore therethrough for communicating with the interior bottom portion of a container, means for bringing about relative movement between the support and the plug for causing the latter to enter a container on the support and displace air therefrom and then withdraw from said container, and means for directing a gas through the plug bore into said container before withdrawal thereof for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of said plug for replacing with gas all air displaced from the container, said body bore and said plug respectively including flared and tapered portions effective to guide entrance of containers into the gassing chamber.

6. In apparatus of the character described, a rotary turret including a head and empty container supporting means opposed to said head, said head having a plurality of bores therein each forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically with respect to each gassing chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for bringing about relative movement between the supporting means and the plugs for causing the latter to enter containers on the supporting means and displace air therefrom and then withdraw from said containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of the plugs for replacing with gas all air displaced from said containers, means for feeding air filled containers onto said supporting means, and means for delivering gas filled containers from said supporting means.

7. In apparatus of the character described, a rotary turret including a head and empty container supporting means opposed to said head, said head having a plurality of bores therein each forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically with respect to each gassing chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for bringing about relative movement between the supporting means and the plugs for causing the latter to enter containers on the supporting means and displace air therefrom and then withdraw from said containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of the plugs for replacing with gas all air displaced from said containers, means for feeding air filled containers onto said supporting means, means for delivering gas filled containers from said supporting means, and housing means associated with said delivery means for maintaining an inert gas atmosphere about the gassed containers as they are being delivered away from said turret.

8. In apparatus of the character described, a rotary turret including a head and empty container supporting means opposed to said head, said head having a plurality of bores therein each forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically with respect to each gassing chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for bringing about relative movement between the supporting means and the plugs for causing the latter to enter containers on the supporting means and displace air therefrom and then withdraw from said containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not dis-

placed by entrance of the plug and for continuing the gas introduction during withdrawal of the plugs for replacing with gas all air displaced from said containers, means for feeding air filled containers onto said supporting means, and means for delivering gas filled containers from said supporting means, said head and said supporting means including opposed mutually engaging and engageable surface portions effective to provide a restricted air and gas escape passage open during the air expulsion by gas injection functions and for sealing the gassing chambers following completion of the air expulsion and during withdrawal of the plugs from the containers.

9. In apparatus of the character described, a rotary turret including a head and empty container supporting means opposed to said head, said head having a plurality of bores therein each forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically with respect to each gassing chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for bringing about relative movement between the supporting means and the plugs for causing the latter to enter containers on the supporting means and displace air therefrom and then withdraw from said containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of the plug for replacing with gas all air displaced from said containers, said gas directing means including a stationary plate having an arcuate recess in the under surface thereof extending over and communicating with a plurality of the plug bores and a duct for delivering an inert gas under pressure into said recess, means for feeding air filled containers onto said supporting means, and means for delivering gas filled containers from said supporting means.

10. In apparatus of the character described, a rotary turret including a head enlargement and a depending skirt, a casing shell surrounding the turret in engagement with the head and spaced outwardly from the skirt, a plurality of individually reciprocable container supporting blocks movable in contact with each other and with the skirt and shell in the space intervening the skirt and shell beneath the head, said head having a plurality of bores therein each centered over one block and forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically in each chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for rotating the turret, means for successively lifting the blocks to cause the plugs to enter containers on the blocks and displace air therefrom and then lower the blocks to bring about withdrawal of the plugs from the containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of the plugs for replacing with gas all air displaced from said containers, means for feeding air filled containers onto the blocks, and means for delivering gas filled containers from said blocks.

11. In apparatus of the character described, a rotary turret including a head enlargement and a depending skirt, a casing shell surrounding the turret in engagement with the head and spaced outwardly from the skirt, a plurality of individually reciprocable container supporting blocks movable in contact with each other and with the skirt and shell in the space intervening the skirt and shell beneath the head, said head having a plurality of bores therein each centered over one block and forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically in each chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for rotating the turret, means for successively lifting the blocks to cause the plugs to enter containers on the blocks and displace air therefrom and then lower the blocks to bring about withdrawal of the plugs from the containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of the plugs for replacing with gas all air displaced from said containers, said gas directing means including a stationary plate having an arcuate recess in the under surface thereof extending over and communicating with a plurality of the plug bores and a duct for delivering an inert gas under pressure into said recess, means for feeding air filled containers onto the blocks, and means for delivering gas filled containers from said blocks.

12. In apparatus of the character described, a rotary turret including a head enlargement and a depending skirt, a casing shell surrounding the turret in engagement with the head and spaced outwardly from the skirt, a plurality of individually reciprocable container supporting blocks movable in contact with each other and with the skirt and shell in the space intervening the skirt and shell beneath the head, said head having a plurality of bores therein each centered over one block and forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically in each chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for rotating the turret, means for successively lifting the blocks to cause the plugs to enter containers on the blocks and displace air therefrom and then lower the blocks to bring about withdrawal of the plugs from the containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during with-

drawal of the plugs for replacing with gas all air displaced from said containers, said gas directing means including a stationary plate having an arcuate recess in the under surface thereof extending over and communicating with a plurality of the plug bores and a duct for delivering an inert gas under pressure into said recess, means for feeding air filled containers onto the blocks, and means for delivering gas filled containers from said blocks, said shell having an opening therein extending from the point at which the air filled containers are fed onto the blocks to a point a distance beyond the commencement of the gassing recess, and said block lifting and lowering means including a cam effective to lift each block into and hold it for an interval of travel in close proximity with but out of contact with the head while a plug is in air displacing relation in the container supported on the particular block, then lift the block into sealing contact with the head, and then lower the block after the block next succeeding has been moved into sealing contact with said head.

13. In apparatus of the character described, a rotary turret including a head enlargement and a depending skirt, a casing shell surrounding the turret in engagement with the head and spaced outwardly from the skirt, a plurality of individually reciprocable container supporting blocks movable in contact with each other and with the skirt and shell in the space intervening the skirt and shell beneath the head, said head having a plurality of bores therein each centered over one block and forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically in each chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for rotating the turret, means for successively lifting the blocks to cause the plugs to enter containers on the blocks and displace air therefrom and then lower the blocks to bring about withdrawal of the plugs from the containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of the plugs for replacing with gas all air displaced from said containers, said gas directing means including a stationary plate having an arcuate recess in the under surface thereof extending over and communicating with a plurality of the plug bores and a duct for delivering an inert gas under pressure into said recess, means for feeding air filled containers onto the blocks, and means for delivering gas filled containers from said blocks, said shell having an opening therein extending from the point at which the air filled containers are fed onto the blocks to a point a distance beyond the commencement of the gassing recess, and said block lifting and lowering means including a cam effective to lift each block into and hold it for an interval of travel in close proximity with but out of contact with the head while a plug is in air displacing relation in the container supported on the particular block, then lift the block into sealing contact with the head, and then lower the block after the block next succeeding has been moved into sealing contact with said head, each said block having provision for yieldably engaging said head.

14. In apparatus of the character described, a rotary turret including a head enlargement and a depending skirt, a casing shell surrounding the turret in engagement with the head and spaced outwrdly from the skirt, a plurality of individually reciprocable container supporting blocks movable in contact with each other and with the skirt and shell in the space intervening the skirt and shell beneath the head, said head having a plurality of bores therein each centered over one block and forming a gassing chamber only slightly larger in diameter than the external diameter of containers to be gassed therein, a solid walled plug disposed concentrically in each chamber and of a diameter only slightly less than the internal diameter of containers to be gassed in said chambers, each said plug having a bore therethrough for communicating with the interior bottom of containers, means for rotating the turret, means for successively lifting the blocks to cause the plugs to enter containers on the blocks and displace air therefrom and then lower the blocks to bring about withdrawal of the plugs from the containers, means for directing a gas through each plug bore into a container before withdrawal of the plug therefrom for forcing air from the container not displaced by entrance of the plug and for continuing the gas introduction during withdrawal of the plugs for replacing with gas all air displaced from said containers, said gas directing means including a stationary plate having an arcuate recess in the under surface thereof extending over and communicating with a plurality of the plug bores and a duct for delivering an inert gas under pressure into said recess, means for feeding air filled containers onto the blocks, and means for delivering gas filled containers from said blocks, said shell having an opening therein extending from the point at which the air filled containers are fed onto the blocks to a point a distance beyond the commencement of the gassing recess, and said block lifting and lowering means including a cam effective to lift each block into and hold it for an interval of travel in close proximity with but out of contact with the head while a plug is in air displacing relation in the container supported on the particular block, then lift the block into sealing contact with the head, and then lower the block after the block next succeeding has been moved into sealing contact with said head, each said plug having a tapered end portion and each plug surrounding head bore having a flared portion for facilitating entry of and rounding up containers being gassed.

ALFRED L. KRONQUEST.