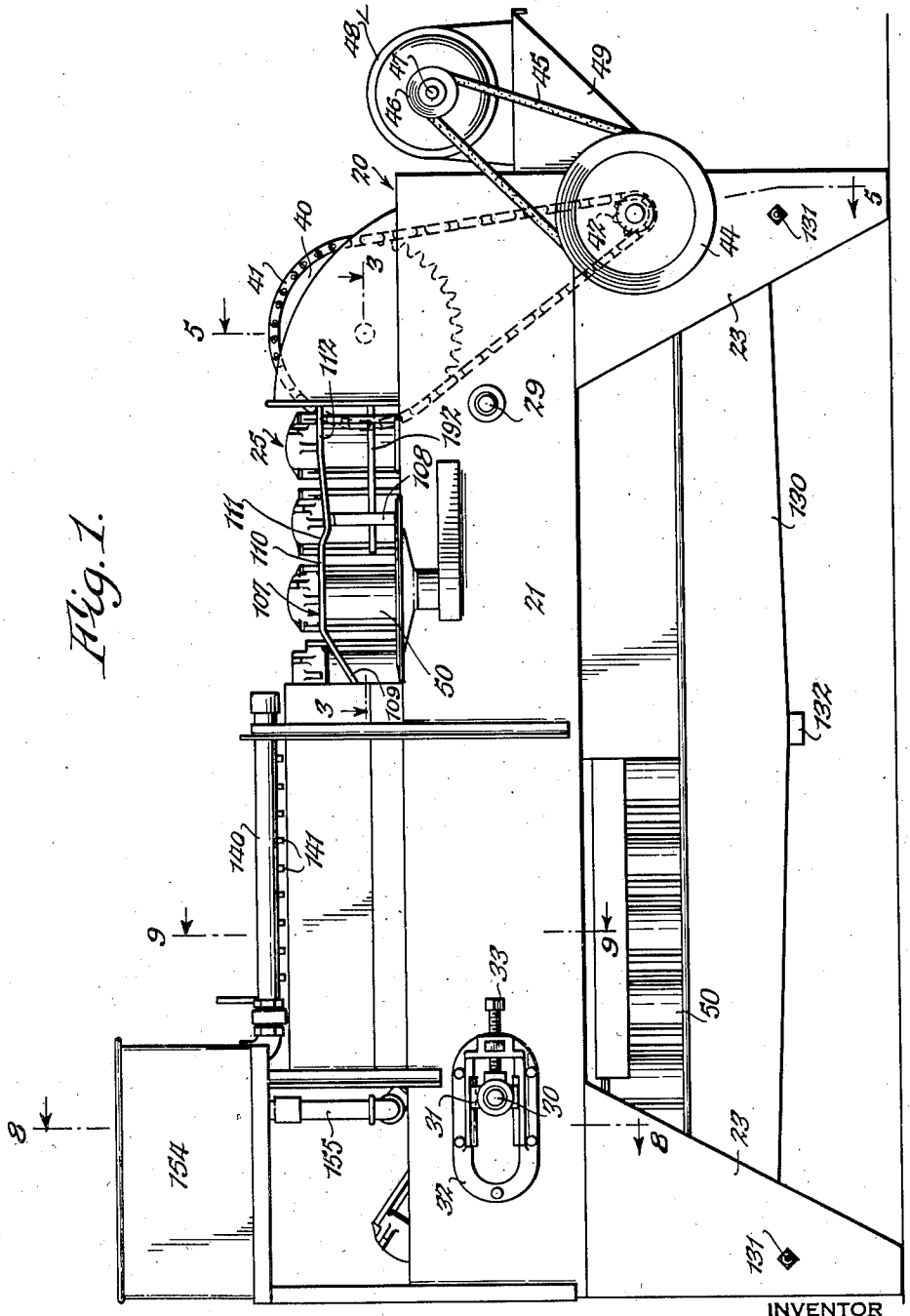
Feb. 16, 1943. W. DE BACK 2,310,940

CAN DRAINING AND FILLING APPARATUS

Filed July 15, 1940 6 Sheets-Sheet 1

Fig. 1.



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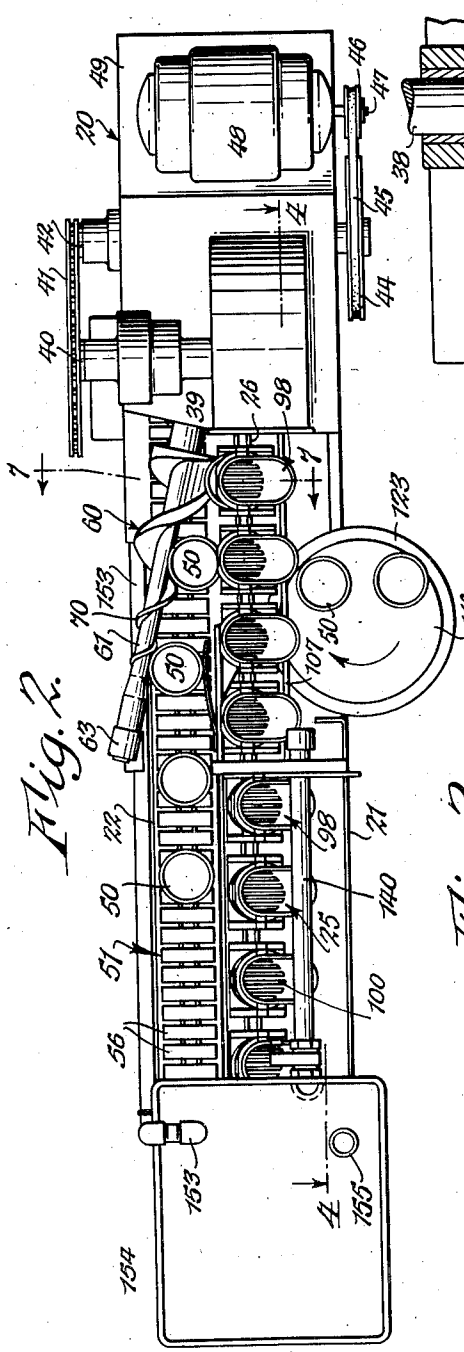


Fig. 2.

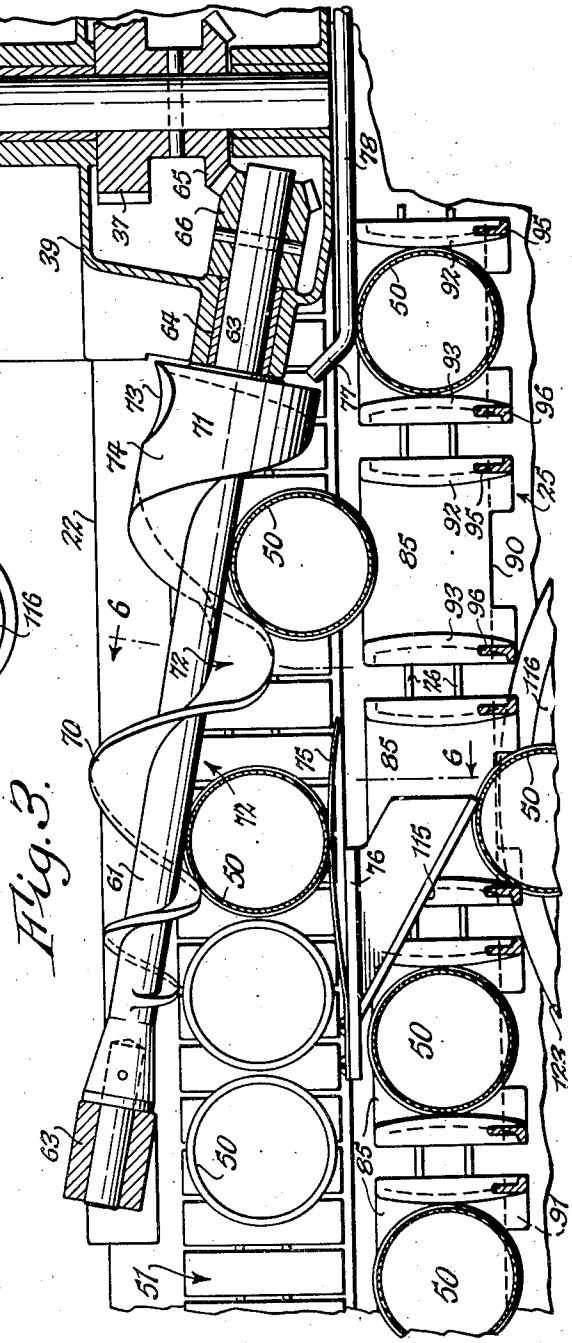


Fig. 3.

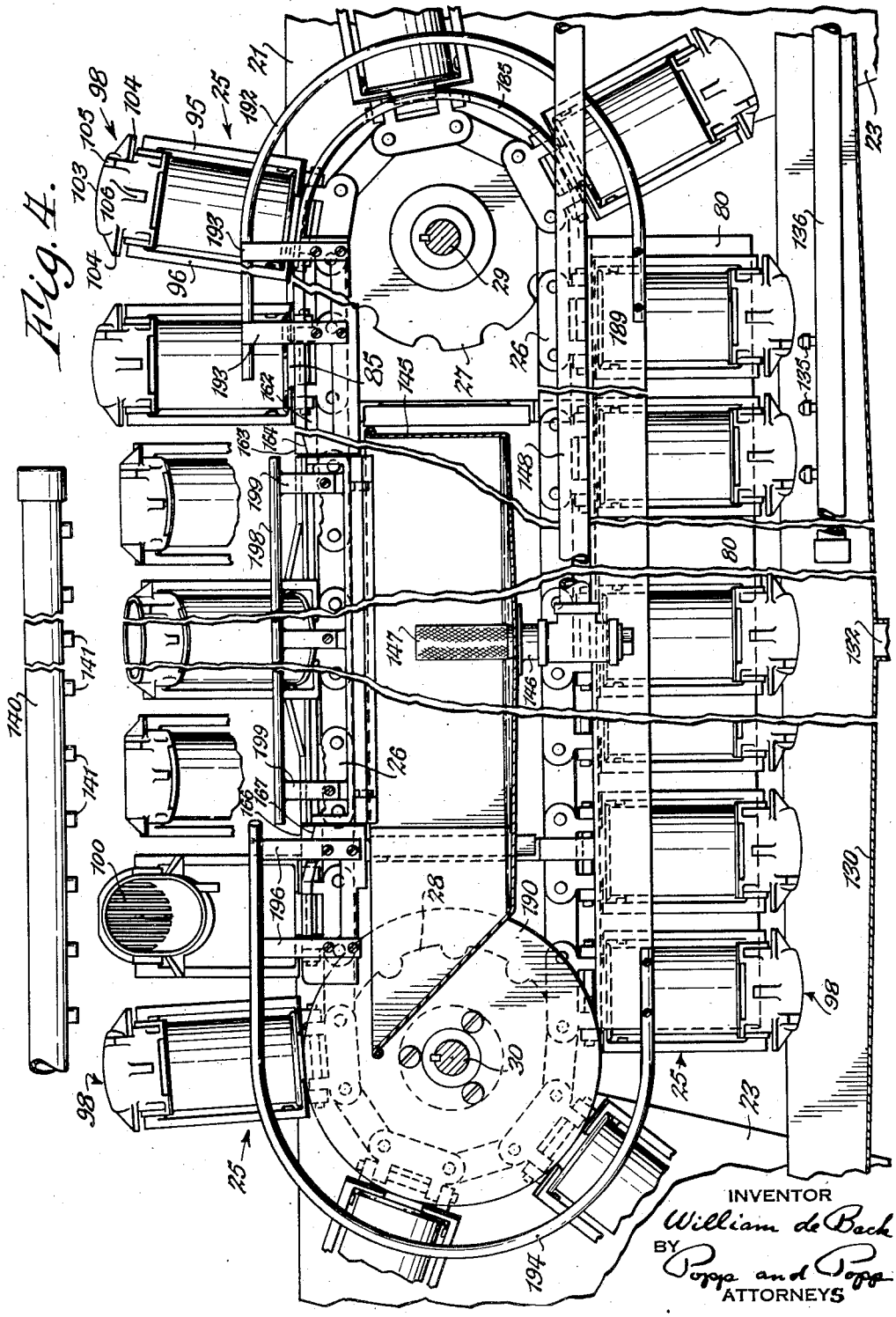
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CAN DRAINING AND FILLING APPARATUS

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Fig. 4.



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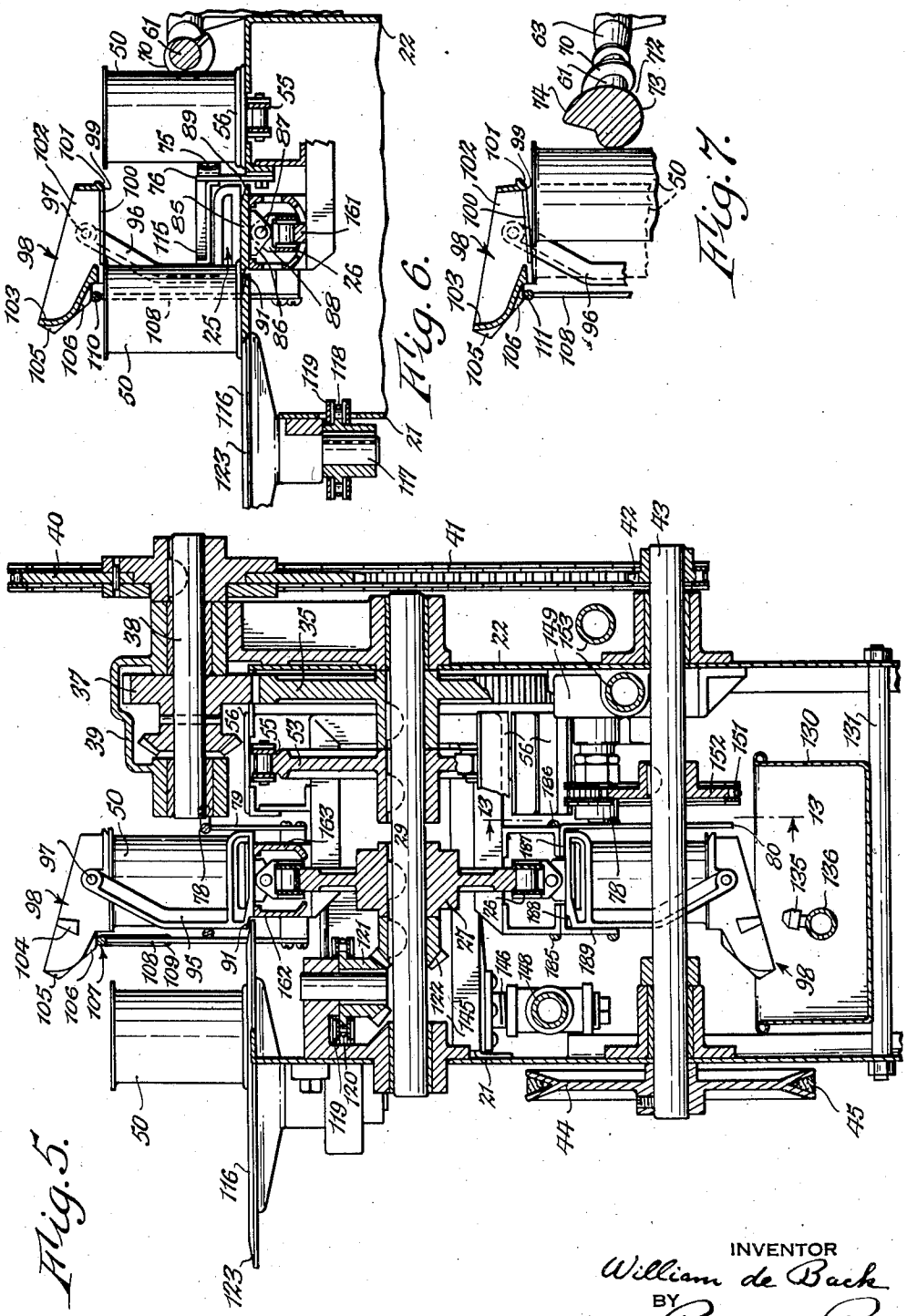


Fig. 5.

Fig. 6.

Fig. 7.

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CAN DRAINING AND FILLING APPARATUS

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Fig. 9.

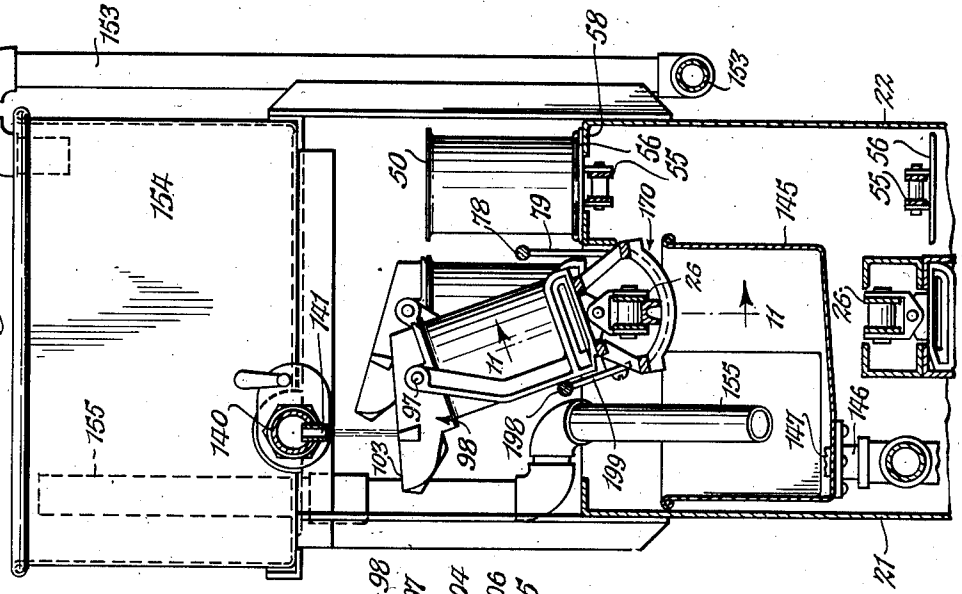


Fig. 10.

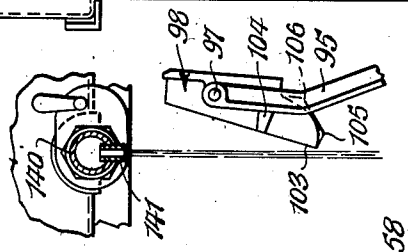
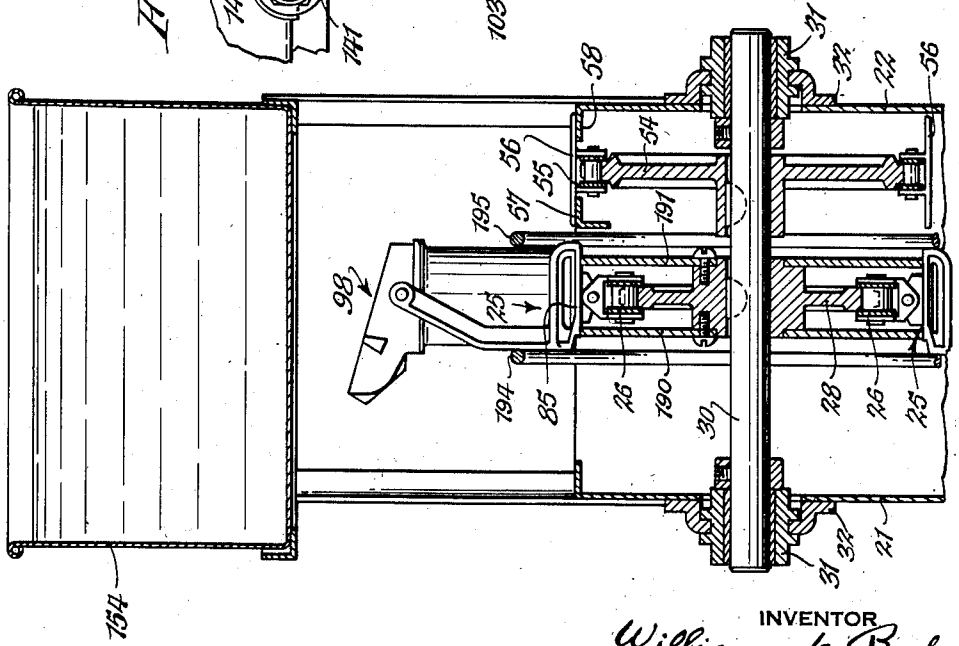


Fig. 8.



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CAN DRAINING AND FILLING APPARATUS

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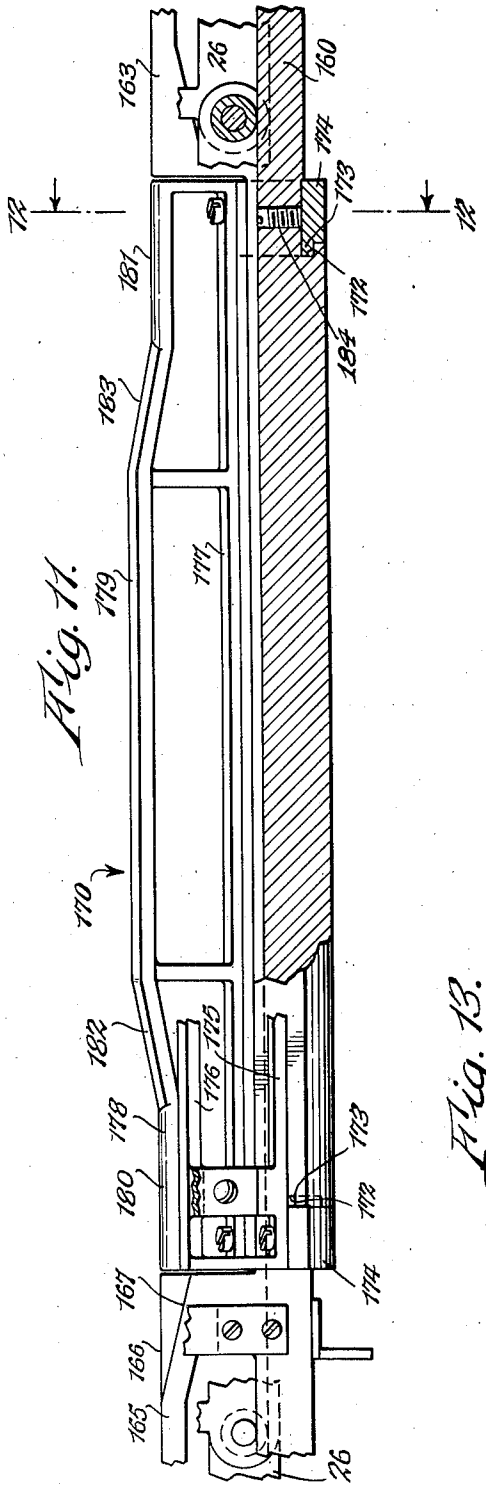


Fig. 11.

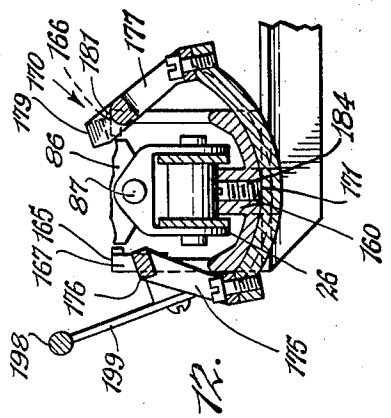


Fig. 12.

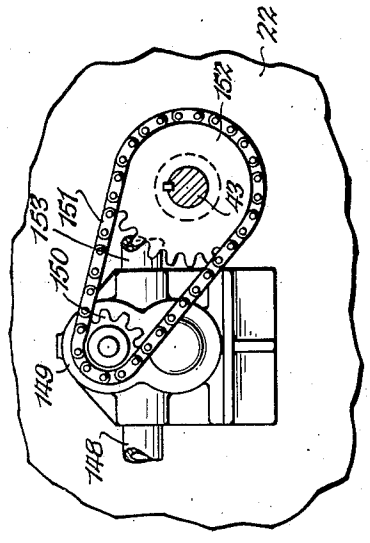


Fig. 13.

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UNITED STATES PATENT OFFICE

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CAN DRAINING AND FILLING APPARATUS

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Application July 15, 1940, Serial No. 345,480

10 Claims. (Cl. 226—22)

This invention relates to apparatus for cleaning foodstuffs packed within cans and subsequently filling the cans with liquid and more particularly to such apparatus which receives and discharges a continuous stream of cans filled with vegetables or the like; thoroughly washes the cans and the contents; drains the wash water from the cans and then fills the cans to a predetermined level with brine or other liquid used as the preserving medium, the cans being thereafter sealed and the contents cooked.

One of the principal objects of the invention is to provide apparatus of the character described which is compact, continuous in operation and of high capacity so that a large number of cans filled with foodstuffs, such as vegetables, can be rapidly washed, drained and filled with liquid.

Another object of the invention is to provide a simple and efficient transfer device for moving the filled cans to be processed from a supply chain to the machine which transfer means also moves the cans into holders in proper timed relation, the cans being retained in these holders until washed, drained, filled and discharged from the apparatus.

Another object of the invention is to provide a simple form of such can carriers, the can carriers being mounted on an endless chain and carrying the cans in an upright and inverted condition along the upper and lower stretches of the conveyer and the holder retaining the contents in the can when the can is moving in an inverted position.

Another object of the invention is to provide a simple means for washing the contents of the cans as they move along in an inverted position, sprays being arranged under the lower stretch of the conveyer and discharging upwardly into the inverted cans so as to agitate the contents of the cans and secure thorough washing thereof.

Another purpose of the invention is to so form the can carriers as to permit the spray water to pass directly into the interior of the cans.

Another object of the invention is to insure the complete discharge of the wash water from the cans not only by natural drainage but also by a whipping action which occurs when the can carriers are carried around the sprockets which support the endless chain on which the can carriers are mounted.

Another object of the invention is to provide a means, along the upper stretch of the conveyer, for filling the washed and drained cans with brine or other liquid, this liquid being retained in the cans until opened by the user.

Another object of the invention is to provide a simple device for adjustably tilting the cans to any desired angle while being so filled, this device serving to discharge the excess brine and insuring that each can is filled, less than to capacity, with a predetermined amount of brine.

Another object of the invention is to provide such apparatus in which any carrier which does not contain a can is retained in a collapsed condition out of line with the brine filling streams so that empty carriers are not unnecessarily splattered with brine.

Another object of the invention is to provide such apparatus in which the excess brine supplied to the cans is recirculated so as to avoid waste.

In the accompanying drawings:

Fig. 1 is a side elevation of apparatus made in accordance with my invention and adapted to receive cans filled with foodstuffs, subject the filled cans to a washing operation, drain the wash water, fill the cans with a preserving liquid to a predetermined degree and discharge the cans so filled from the apparatus.

Fig. 2 is a top plan view thereof.

Fig. 3 is an enlarged, fragmentary, horizontal section, taken on line **3—3**, Fig. 1.

Fig. 4 is an enlarged fragmentary, vertical section, taken on line **4—4**, Fig. 2.

Fig. 5 is an enlarged, fragmentary, transverse section, taken on line **5—5**, Fig. 1.

Fig. 6 is a fragmentary, vertical, enlarged, transverse section, taken on line **6—6**, Fig. 3 and showing a can being discharged from the apparatus and another can being admitted to replace the can so discharged.

Fig. 7 is a vertical, fragmentary, enlarged, transverse section, taken on line **7—7**, Fig. 2 and showing a can entering the apparatus.

Figs. 8 and 9 are fragmentary, vertical, transverse sections, taken on the correspondingly numbered lines of Fig. 1, Fig. 9 showing the manner in which the can is tipped to receive the stream of brine, such tipping also insuring that the can is filled, less than to capacity, with a predetermined amount with brine.

Fig. 10 is an enlarged, fragmentary view similar to Fig. 9 showing the position of the can carrier when it does not contain a can, the carrier being carried to one side of the streams of brine so as to avoid splattering of the carrier.

Fig. 11 is a horizontal section, with parts broken away, taken generally on line **11—11**, Fig. 9 and showing the tiltable track, whereby the cans can be filled with different amounts of liquid.

Fig. 12 is a fragmentary section, taken on line 12—12, Fig. 11.

Fig. 13 is a fragmentary, vertical, longitudinal section, taken on line 13—13, Fig. 5 and showing the pump which recirculates the brine.

The apparatus embodying my invention is shown as carried by a frame, indicated generally at 20, which includes side plates 21, 22 carried by legs 23 and suitable cross members to provide a rigid frame. The cans to be processed are received in can carriers, indicated generally at 25, which can carriers are rockably mounted on an endless conveyer chain 26. This chain is carried at one end by a drive sprocket 27 and at its opposite end by an idler sprocket 28, the sprocket 27 being mounted on a drive shaft 29 suitably journaled in the side plates 21 and 22 of the machine frame and the idler sprocket 28 being mounted on an idler shaft 30 which is carried by adjustable bearings 31 mounted on the side plates 21 and 22 of the frame. Each of the adjustable bearings is shown as mounted in horizontal slideways formed in a bracket 32 and the adjustment of these bearings is obtained through a screw 33 carried by each bracket 32 and engaging the bearing 31. It will be seen that upon moving the screw 33 the idler sprocket 28 can be shifted to provide the desired tension in the upper and lower stretches of the chain 26.

A drive gear 35, as best shown in Fig. 5, is fast to the drive shaft 29, this gear 35 being driven by a pinion 37 fast to an overhead countershaft 38. The shaft 38 is suitably journaled in a gear casing 39 mounted on the frame 20 and is driven by a sprocket 40 which is fast to the shaft 38. The sprocket 40 is connected by a drive chain 41 with a sprocket 42 fast to a main drive shaft 43, this drive shaft being suitably journaled on the side plates 21 and 22 of the main frame. A drive pulley 44 is fast to the opposite end of the main drive shaft 43, this drive pulley 44 being connected by a belt 45 with any suitable source of power such as the pulley 46 at the end of the shaft 47 of an electric motor 48 mounted on a bracket 49.

The cans 50 which have been filled with the foodstuffs being packed are placed upon the flight of a feeding conveyer, indicated generally at 51, the upper flight of this feeding conveyer being arranged alongside of the line of can carriers 25 transversing the upper stretch of the chain 26 and moving at a slightly higher rate of speed to insure an adequate supply of cans for transference into the can carriers 25. For this purpose a drive sprocket 53 is fast to the shaft 29, as best shown in Fig. 5, and an idler sprocket 54 is fast to the idler shaft 30, as best shown in Fig. 8, these sprockets 53 and 54 being connected by a chain 55 and being arranged alongside and being of larger diameter than the sprockets 27 and 28 so that the chain 55 is driven at a slightly higher speed than the chain 26.

The links of the chain 55 carry a plurality of horizontal slats 56, these slats forming an extended upper surface for receiving the cans 50. In order to prevent sagging of the upper stretch of the chain 55, the opposite ends of the slats 56 are supported on horizontal rails 57 and 58, these rails being mounted on the main frame of the machine in any suitable manner.

The chain 55 is moved to feed the cans 50 toward the right as viewed in Figs. 1–4 and into engagement with a timed feeding screw indicated generally at 60 which screw is synchronized with the operation of the conveyer chain 26 so as to shift one can 50 from the feeding conveyer 51 into each passing can carrier 25 on the conveyer chain 26. Any excess of cans 50 placed on the feeding conveyer 51 are held back by the screw 60 until fed in the proper timed relation to the can carriers 25.

For this purpose, the screw 60 comprises a shank or horizontal shaft 61 which is arranged over the feeding conveyer in the path of the cans 50 carried thereon, the screw being arranged at an angle to the line of movement of the cans on the feeding conveyer so as to gradually displace the cans on the feeding conveyer laterally toward the center of the machine and into the can carriers 25 carried by the conveyer chain 26. The shaft or shank 61 of the screw 60 is journaled at one end in a bearing 63 mounted on the main frame of the machine and at its opposite end in a bearing 64 in the gear case 39 which houses the gears carried by the overhead countershaft 38. As best shown in Figs. 3 and 5, the overhead countershaft 38 carries a beveled gear 65 which is preferably made integral with the driving pinion 37, this beveled gear 65 meshing with and driving a beveled pinion 66 fast to the end of the screw shaft 61. The thread 70 on the screw shaft 61 is of peculiar form to effect the timed transfer of the cans 50 into the can carriers 25. This thread 70 is generally in the form of a spiral, its convolutions generating adjacent the bearing 63, and increasing in pitch and lateral amplitude toward the bearing 64. This thread terminates at its maximum amplitude in an enlarged solid portion 71, the groove 72 between the convolutions of the thread 70 being continued into this solid portion but being formed therein to become rapidly shallower so as to form a cam groove 73 which effects a rapid lateral transfer of each can 50 which is caught in the groove 72 and carried down this groove into the cam groove 73. This cam groove 73 is formed to substantially merge into the cylindrical surface 74 of the enlarged solid portion 71 as best shown in Fig. 3.

The first of the line of cans assembled on the feeding conveyer 51 is urged into engagement with the lead end of the thread 70 of the screw 60 by a leaf spring 75 which is secured to the outer face of a bracket 76 which is in turn mounted on the main frame of the machine. This first can is picked up by the first convolution of the thread of the screw 60 which is rotating so as to move this can in the direction of movement of the two conveyers 51 and 26. The can so moving engages the shaft 61 of the screw 60 and since this shaft is set at an angle, the moving can is forced laterally against the resistance of the spring 75. When this can passes between the second convolution of the thread of the screw, the small initial convolution of the screw picks up the next succeeding can in the line assembled on the conveyer 51. The cans thereby travel along the groove 72 between the several convolutions of the thread 70 in procession, one between each convolution, and when the first reaches the continuation 73 of this groove in the enlargement 74, the rapid reversal of the form of this groove quickly forces the leading can laterally into the adjacent can carrier 25. It will be seen that the screw 60 can readily be designed and timed to deposit one can in each of the can carriers 25 as the series of can carriers pass by and that this transfer of the can is effected positively and without danger of jamming. The completion of the insertion of the cans in the can carriers 25

can be effected by the inclined end 77 of a guide rail 78, this end engaging each can as it is moved along by the conveyer chain 26 and completing its lateral movement into its carrier. The rail 78 is suitably supported on small posts 79 and extends around the driving sprocket 27, its lower end being secured to the outside of a deep plate 80 projecting downwardly from the frame along the corresponding side of the lower stretch of the chain 26.

Each of the can carriers 25, comprises a base plate 85 having a downwardly projecting central lug 86 which carries a pivot pin 87, this pin extending horizontally when the can carrier is on the upper and lower stretches of the chain 26, and in the direction of movement of the carrier. This pivot pin extends through ears 88 projecting laterally outwardly from alternate links of the chain 26 so that the base is free to swing from side to side. On its can receiving side the base plate 85 of each can carrier is beveled as indicated at 89 on its upper side so that transfer of a can from the feeding chain 51 to each base plate 85 by the screw 60 is effected smoothly and without interruption. The opposite edge of the base plate 85 is indented, as indicated at 90, and the extensions formed by this indentation are beveled on their undersides, as indicated at 91 so as to facilitate the discharge of the cans from the carrier as hereinafter described.

Each of the base plates is provided along its advancing and trailing sides with front and rear walls 92, 93, these walls thereby extending transverse to the direction of movement of the carriers and forming an open sided pocket or cradle for receiving the cans. These walls 92 and 93 can be of any suitable form but, as best shown in Fig. 3, are preferably tapered toward a thicker center so as to insure the free entry and proper positioning of the cans in the can carriers, and the free discharge of the cans therefrom.

On the discharge side of each of the base plates 85 of the can carriers, two posts 95, 96 rise from the side walls 92, 93, these posts being preferably formed integral with these walls and the base plate and being bent laterally at their upper ends so as to terminate approximately over the center of the can carrier. At their upper ends these posts 95, 96 carry the pivot pins 97 of a swinging top member 98 which performs a number of functions. This swinging top member is generally of round cup-shaped form having a bottom 99 which is smooth on its underside to engage the upper rim of the open cans 50 and this bottom also being slotted, as indicated at 100 so as to form a screen for the open end of a can 50 so engaged. On the can receiving side of the can carrier the bottom 99 is provided with an undercut bevel 101 to facilitate the movement of the cans to a position thereunder. The side walls 102 of this swinging top member 98 rise from the edges of the bottom 99 and at the discharge side of the can carrier, this side wall is formed to provide a laterally extending lip 103, this lip overbalancing the swinging top member so that it normally falls to the generally upright position illustrated in Fig. 10, the top being limited in this movement by a pair of stop lugs 104 projecting outwardly from the sides of the lip to engage the posts 95, 96 when the top falls to the upright position illustrated in Fig. 10. Each lip 103 is also provided on its underside with a lug 105 and a lug 106, these lugs functioning to control the swinging movement of the swinging top member through their engagement with a controlling guide rail indicated generally at 107.

This rail 107 is suitably supported by posts 108 along the upper stretch of the conveyer chain 26 at the can feeding and discharging stations. This rail starts at a comparatively low elevation, as indicated at 109 and rises to its maximum height and proceeds horizontally, as indicated at 110 along the discharging station. Beyond the discharging station the rail drops sharply down, as indicated at 111, following which it again rises to its maximum height and proceeds horizontally for a short distance, as indicated at 112. By this undulating form of the rail 107, the position of the swinging top 98 is controlled to permit the automatic feeding and discharge of the cans 50 onto and from the main conveyer. At the feeding station the lower lug 106 of the swinging top 98 of the can carrier riding along the top of the rail 107, drops into the depression 111 of this rail. This position of the parts is illustrated in Fig. 7. Since the lip 103 overbalances the top 98 in its movement around the pivots 97, the beveled intake side 101 of this swinging top rises and its discharge side drops on encountering the depression, so that the top is held in the slightly angular position shown in Fig. 7, this position insuring the ready insertion of a can 50 onto the base plate 85 of the can carrier and under the swinging top 98 by the timed feed screw 60. As the screw is moving the can toward the center of the can carrier, the lug 106 is riding up the incline of the section 112 of the rail 107 so that the bottom 99 of the swinging top 98 is brought into parallelism with the rim of the can. It will be understood that the relation of this rise to the feeding of the can into the can carrier by the screw 60 is not critical inasmuch as the insertion of the can itself would bring the top 98 into approximate parallelism with the rim of the can. When the can is centered relative to the carrier and the swinging top 98, as illustrated in Figs. 5 and 8, there is no further necessity for the rail 107 since the swinging top 98 is held against swinging by the can itself. On passing beyond this rail, therefore, the can is held between the base plate 85 and the swinging top until the lug 106 reengages the part of the rail 107 which rises to the elevation 110 at the discharging station. When this is engaged, the swinging top 98 is brought into substantially exact parallelism with the rim of the can so that the can can be readily slid out from under the top without having the top cock or swing so as to interfere with the free discharge of the can.

This discharge of the can from the carriers 25 as they pass the discharge station is shown as comprising a cam extension 115 on the fixed bracket 76, which extension projects into the path of the cans, as best shown in Figs. 3 and 6, from the right hand or feeding side, as shown in Fig. 6. When the cans encounter this fixed discharge cam 115, they are forced out of the carriers 25 and since at this time the swinging tops 98 of the cam carriers are supported on the high straight part 110 of the rail 107, this discharge of the cans is not interfered with by any irregular or cocking movement of the swinging tops 98. The cans are discharged by this stationary cam onto the upper horizontal face of a can discharge wheel 116 which is suitably jour-

naled on the main frame of the machine to rotate about a vertical axis. The depending shaft 117 of this can discharge wheel, as best shown in Fig. 6, carries a sprocket 118 which is driven by a chain 119. This chain, as best shown in Fig. 5, is driven by a sprocket 120 which is formed integrally with a beveled pinion 121 meshing with a pinion 122 fast to the horizontal shaft 29 from which the conveyer chains 26 and 51 are driven. The can discharge wheel 116 is therefore rotated in the direction of the arrow shown in Fig. 2 and is driven in synchronism with the movement of the can carriers. To facilitate the transfer from the can carriers onto the discharge wheel 116, the periphery of the can wheel is beveled on its upper side, as indicated at 123 so as to fit under the bevels 91 at the discharge side of the base plates 85 of the can carriers. By so beveling the can discharge wheel 116 and the discharge sides of the base plates 85, it will be seen that the transfer of the cans to the can wheel by the stationary cam 115 is effected smoothly in the manner illustrated in Fig. 6.

In the event that the cans 50 are so placed on the feeding conveyer 51 that the screw 60 fails to pick up a can in proper succession, one of the can carriers will not, of course, receive a can and will go around to the dischargiing station empty. Under such conditions, when the lug 106 of the swinging top of the empty can carrier 25 rides beyond the end of the rail 107, the swinging top 98 drops to the upright position shown in Fig. 10, the side stops 104 limiting the swinging movement. When the can carrier is inverted in traversing the lower stretch of the chain 26, the top 98 will, of course, swing around but upon reentering the upper stretch will assume the position shown in Fig. 10. In this position the lug 105 is in position to engage the depressed advance end 109 of the rail 107 and as the lug rides up the incline to the horizontal elevation 110 of this rail, the swinging top 98 is swung from the position shown in Fig. 10 to the position shown in Fig. 6, the rail being reengaged by the lug 106. Upon then passing to the feeding station, the parts assume the position shown in Fig. 7 to receive a can from the feed screw 60.

The cans fed to the can carriers 25 on the chain 26 by the feeding screw 60 are filled with the vegetables being packed and also contain wash water. In the course around the chain 26, this wash water is slung out; the vegetables in the cams are subjected to cleaning sprays while the cans pass in an inverted position along the lower stretch of the chain 26; the wash water from the sprays is slung out; and the cans are filled with a predetermined level of brine before the cans are discharged from the apparatus.

To this end, a wash water drain pan 130 extends the full length of the machine and is arranged under the conveyer chain 26 so that the inverted cans drain into this drain pan. This drain pan is shown as supported on cross rods 131 carried between the legs 23 and as having a sloping bottom leading to a drain pipe 132. After the cans carried by the can carriers 25 pass beyond the filling station the chain 26 passes around the drive sprocket 27 which is of sufficiently small diameter that the can carriers with their contained cans are slung violently around the sprocket and the wash water contained in the cans slung outwardly by centrifugal force. The free escape of the initial water contained within the cans is permitted by the slots 100 in the swinging tops 98 of the can carriers, these slots, however, retaining the vegetables packed in the cans. The wash water so expelled is caught by the drain pan 130.

The cans traversing the lower stretch of the conveyer chain 26 are in an inverted position, the contents of the cans being supported by the slotted swinging tops 98 of the can carriers. While in this position the cans pass over upwardly directed nozzles 135 on a horizontal spray pipe 136 contained within the drain pan 130. These nozzles are supplied with water under pressure and spray against the slotted portion of the swing heads 98 of the can carriers so as to enter the can and wash the vegetables contained therein. The sprays so entering the inverted cans from the nozzles 135 is of sufficient violence to agitate the contents and insure their proper washing.

After passing over the spray nozzles 135, the cans in the carriers 25 continue in an inverted position over the drain pan 130, the wash water sprayed into the cans thereby draining out of the cans through the slots in the swinging heads 98 which support the cans and their contents when the cans are in an inverted condition. This wash water drains into the drain pan 130. The cans then pass around the driven sprocket wheel 28. In so passing around this sprocket, the cans are again slung around so that any free wash water from the sprays 135 is expelled by centrifugal force. This expelled wash water is also caught in the drain pan 130.

Upon emerging on the upper stretch of the conveyer chain 26, the can carriers 25 pass below a horizontal filling pipe 140 from which streams of brine or other liquid in which the vegetables are to be packed fall from nipples 141 provided in the bottom of this pipe. The cans carried by the can carriers 25 are not arranged directly under the nipples 141 and the filling pipe is arranged to one side of the machine, as best illustrated in Fig. 9, so that the streams falling from the nipples 141 are caught by the laterally extended lips 103 of the swinging tops 98 of the can carriers. From these lips 103, the filling liquid flows down through the slots 100 to fill the cans in the can carriers. By this arrangement, however, the filling liquid is caught by the lips 103 with a minimum of splashing and it will also be particularly noted that when a passing can carrier 25 is empty and the swinging top 98 is thereby in the upright position shown in Fig. 10, the streams of filling liquid falling from the nipples 141 miss the can carrier completely so as to avoid needless splashing of the carrier and associated parts and consequently unnecessary incrustation of these parts.

The filling liquid from the nipples 141 not caught by the lips 103 of the can carriers, or overflowing from the cans 50, falls into a collecting tank 145 which is suitably supported between the upper and lower passes of the chain 26 which carries the can carriers and is arranged under the nipples 141 of the filling pipe so as to catch the excess filling liquid. The outlet 146 from this collecting tank is protected by a screen 147 which holds any loose pieces of vegetables in the collecting tank but permits the filling liquid to pass to a horizontal outlet pipe 148 leading to the inlet of a gear pump 149 as illustrated in Figs. 5 and 13. This pump is shown as having a drive sprocket 150 connected by a chain

151 with a sprocket 152 fast to the main drive shaft 43. The outlet line 153 from this pump discharges into an overhead tank 154 to which the filling pipe 140 is connected. This tank serves as a reservoir for the liquid with which the cans are filled and also as a gravity feed for the streams discharged from the nipples 141. The overhead tank 154 is also provided with an overflow pipe 155 which, as best shown in Fig. 9, discharges any excess liquid into the drain pan.

The amount of this liquid supplied to each can can be adjusted by causing the cans to pass the streams of liquid falling from the nipples 141 in a tilted position, the degree of tilt determining the amount of liquid retained by the cans. For this purpose each can carrier is connected to the chain 26 by the pivots 87 which permit the cans to tilt sidewise on passing these streams. Except when passing these streams, however, it is desirable to hold the cans straight and perpendicular to the chain 26 to insure proper registry with the various other parts of the apparatus. For these purposes, means are provided which coact with the opposite sides of the can carriers 25 throughout their course, which means are preferably constructed as follows:

The numeral 160 represents a guiding and supporting bar which is suitably supported on the main frame of the machine and extends lengthwise underneath the upper stretch of the conveyer chain 26 from the periphery of the driving sprocket wheel 27 to the periphery of the driven sprocket wheel 28. At its center this bar is provided with a longitudinal upstanding ridge 161 upon which the rollers of the conveyer chain 26 ride so that the upper stretch of the chain is supported its full length and the can carriers 25 are conveyed in a straight line. From the discharging station to the right end of the machine, as viewed in Figs. 1–4, the bar 160 is also formed to provide side rails 162, 163 along which the bottom plates 85 of the can carriers 25 ride so that the can carriers are held in an upright position along this section of the upper stretch of the conveyer chain and prevented from swinging about the pivot pins 87. That end of the side rail 162 toward the center of the machine is beveled at its upper corner, as indicated at 164, this bevel being effective to swing the can carriers from a tilted to an upright position on engaging the side rails 162, 163, as hereinafter described.

The opposite end of the bar 160, i. e. that end adjacent the driven sprocket 28 is formed to provide two side rails 165, 166, as shown in Figs. 4 and 11, these side rails engaging the bottom plates 85 of the can carriers 25, in the same manner as with the side rails 162, 163 at the opposite end of the rail 160, so as to hold the can carriers erect as they emerge on the upper stretch of the conveyer chain 26. That end of the side rail 165 toward the center of the machine is beveled at its upper corner, as indicated at 167, this bevel being effective to swing the can carriers from an upright to a tilted position on leaving the side rails 165, 166, as hereinafter described.

That portion of the bar 160 between the bevels 164 and 167 on the side rails 162 and 165, respectively, carries an adjustable track section, indicated generally at 170, which supports the can carriers 25 to ride along in a tilted position. This track section is arranged under the filling nipples 141 so that by adjusting the inclination of the track section 170, the cans passing thereover can be filled to any desired degree of fullness.

To support the track section 170, the corresponding portion of the bar 160 is enlarged and rounded on its underside, as indicated at 171, the curvature being concentric with the axes of the pins 87 of the conveyer chain 26, as best illustrated in Fig. 12. At the ends of the enlarged rounded part 171 of the bar 160, two concentric end grooves 172 are provided, as best shown in Fig. 11, these end grooves receiving and supporting end tongues 173 of segments 174. The end of the segments 174 adjacent the stationary side rails 162 and 165 are connected by a bracket 175 which can be secured thereto by screws or in any other suitable manner and the upper part of this bracket 175 is formed to provide a straight side rail 176 which forms a connecting rail between the stationary side rails 162 and 165 of the bar 160. The opposite ends of the segments 174 are connected by a bracket 177, the upper part of which is formed to provide a side rail 178 which forms a connecting rail between the stationary side rails 163 and 166 of the bar 160. This side rail 178 is also formed to provide a central elevated portion 179 the high part of which is of substantial extent and is arranged parallel with the conveyer chain 26. This elevated portion 179 is connected to the depressed ends 180, 181 of this rail by inclined portions 182, 183 so that the can carriers ride smoothly onto and off of this elevated portion. The upper faces of the depressed ends 180 and 181 are preferably half round in cross section.

Since the segments 174 can be oscillated to different positions in the grooves 172, it will be seen that the entire track section 170 can be set so that the high part 179 of the side rail 178 is any desired elevation above the companion side rail 176. This movement is, however, preferably limited so that the depressed ends 180 and 181 of the side rail 178 cannot be set above the ends of the adjacent stationary side rails 166 and 163. The set position of the track section 170 can be maintained in any suitable manner, as by the set screw 184 shown in Figs. 11 and 12, the head of which is accessible through the chain 26.

Assuming the track section 170 set at the angle illustrated in the drawings, it will be seen that since the bottom plates 85 of the can carriers 25 are generally square in plan, the can carriers being conveyed along the upper stretch of the conveyer chain 26 will be maintained upright until the trailing edge of the bottom plates 85 ride down the incline or bevel 167 at the end of the stationary side rail 165. The preponderating weight of the lip 103 of the can carrier 25 causes the can carrier to tip to the left as viewed in Figs. 8 and 9 and at approximately this same time the leading edge of the bottom plate 85 of the can carrier engages the inclined part 182 of the rail 178 of the track section 170. In riding up this incline the can carrier is positively tipped and on traversing the elevated portion 179 of the rail 178, the can carrier is held in the position shown in Fig. 9. In this position the bottom plate 85 of the can carrier is in engagement with both the side rail 176 and the elevated part of the side rail 178 and hence the can will only be filled with the filling liquid falling from the nipples 141 up to the lowest point of its rim. As the trailing edge of the bottom plate 85 of the can carrier rides down the incline 183 of the track 178, its advance edge also engages the bevel 164 of the stationary side rail 162 and in riding up this bevel the can carrier is brought to an erect

position before being delivered to the can discharging and can filling stations.

During the passage of the can carriers 25 around the sprockets 27 and 28 and the lower stretch of the conveyer chain 26, they are prevented from tipping about the pivot pins 78 as an axis. For this purpose, a pair of stationary semicircular rails 185, 186 are arranged concentric with the driving sprocket 27, these rails engaging the opposite sides of the bottom plates 85 of the can carriers as they travel around the sprocket 27 so as to hold these plates parallel with the axis of the sprocket. The upper ends of the semicircular rails 185, 186 are secured at their upper ends, respectively, to the ends of the upper stationary rails 162, 163 and at their lower ends to the frame of the machine.

Along the lower stretch of the conveyer 26, the can carriers are held against tipping by the engagement of the bottom plates 85 at one side with a flange 187 of the depending side plate 80 and at the other side by a flange 188 projecting inwardly from a stationary depending side plate 189 arranged on the side of the path of the can carriers opposite from the plate 80.

To hold the can carriers against tipping while passing around the driven sprocket wheel 28 and before being delivered onto the upper stationary side rails 165, 166, a pair of disks 190, 191 are suitably secured to the opposite ends of the hub of the driven sprocket wheel 28, as best shown in Fig. 8, these plates or disks extending to engage the bottom plates 85 of the can carriers on opposite sides of the pivots 87 and hence hold them against tipping while passing around the driven sprocket.

Throughout their course in the can carriers 25, the cans 50 are prevented from slipping sidewise out from between the bottom plates 85 of the can carriers and the swinging tops 98. For this purpose the side rail 78, the front end 77 of which positions the cans within the carriers, extends concentrically around the driving sprocket 27 alongside the path of the can holders and on the other side of the can holders a similar rail 192 is provided which is secured at its upper end to posts 193 and at its lower end to the plate 189. The depending side plates 80 and 189 serve to retain the cans in the carriers along the lower stretch of the conveyer chain 26. Around the driven sprocket 28, the cans are prevented from moving sidewise out of the holders by curved rails 194 and 195, these being secured at their lower ends, respectively, to the plates 189 and 80 and at their upper ends to posts 196. The cans are prevented from falling from the can carriers while traversing the inclined track section 170 by a side rail 198 along the depressed side of the track section and supported by posts 199.

In the operation of the apparatus the open cans filled with the vegetables to be packed, such for example as string beans, are placed upon the upper stretch of the can feeding conveyer 51, these cans also being filled with wash water. These cans are conveyed toward the screw 60 against which they pile up, the cans being pressed against the side of the screw by the spring 75. The rotation of the screw 60 picks up one can at a time between its convolutions and since the screw is inclined the cans are moved laterally into the can conveyers 25 on the conveyer chain 26. The screw 60 is rotated in timed relation to the movement of the chain 26 so that the transfer of each can into the can carriers by the enlarged portion 74 of the screw 60 which contains the cam groove 73 is effected with the can in proper registry with the corresponding can carrier. The final position of the can is effected by the cam extension 77 of the rail 78.

The endless conveyer chain 26 is moving in the same direction as the feeding conveyer 51 and when each can carrier 25 reaches the point of can transfer by the screw 60 the swinging top 98 of the empty can carrier is permitted to tip slightly to the position shown in Fig. 7. This tipping is permitted by the dip 111 in the guide rail 107 which supports the swinging top members 98 in a generally horizontal position during the feeding into and discharge of cans from the can carrier. The swinging top 98 tips to the position shown in Fig. 7 on encountering the dip 111 by reason of the swinging top member 98 being heavier on that side which is formed to provide the lip 103.

The tipping of the swinging top member 98 to the postiion shown in Fig. 7 is for the purpose of facilitating the insertion of the can between the base plate 85 of each can carrier and the swinging top 98. During this transfer of each can into the can carrier 25 by the screw 60 the can carrier is held upright and its base plate 85 in a horizontal position by the two stationary side rails 162 and 163 which support the bottom surface of the base plates 85 on opposite sides of the pivot pin 87. As the can carriers with the contained cans travel around the driving sprocket 27, this position of the can carriers 25 is maintained by the semicircular side rails 185 and 186 which engage the undersides of the base plates 85 on opposite sides of the pivot pins 87 as the carriers travel around the periphery of this driving sprocket 27. The cans are also prevented from sliding out sidewise from between the base plates 85 and swinging top members 98 of the can carriers when passing around the driving sprocket by the side rails 78 and 192.

As the can carriers swing around the driving sprocket 27 the wash water originally contained within the cans is slung outwardly by centrifugal force through the slots 100 provided in the swinging top member 98. This water is caught in the drain pan 130.

On traversing the lower stretch of the chain 26, the can carriers are prevented from swinging about their pivots 87 by the engagement of the base plates 85 of the can carriers with the inwardly projecting flanges 187 and 188 of the depending side plates 80 and 189. These plates also prevent the cans from sliding out sidewise from between the base plates 85 and the swinging top members 98 of the can carriers. On entering the lower stretch of the conveyer chain 26 the can carriers pass over the nozzles 135 from which wash water is sprayed upwardly. This water passes through the slots 100 in the swinging top members 98 of the can carriers and enters the cans to agitate and wash the contents thereof. This water drains out into the drain pan 130 as the can carriers pass beyond the nozzles 135.

Any free spray water retained in the cans 50 after passing beyond the lower stretch of the conveyer chain 26 is centrifugally slung out of the cans on passing around the driven sprocket 28. This water is caught in the drain pan 130. During their passage around this driven sprocket 28, the can carriers are held in a radial position by the pair of side disks 190, 191 which engage the base plates 85 of the can holders on opposite sides of the pivot pin 87 to hold the cans against tipping about these pivots. The cans are also pre-

vented from slipping sidewise out from between the base plates 85 and the swinging tops 98 of the can carriers by the curved stationary side rails 194 and 195.

On entering the upper stretch of the conveyer chain 26 the lips 103 of the can carriers 25 are moved to pass under the series of nipples 141 of the overhead pipe 140. This pipe is supplied with the liquid with which the contents in the cans are to be packed from the reservoir 154 and the streams of liquid caught by the lips 103 flow down through the slots 100 of the swinging tops 98 and thence into the cans 50. Any liquid escaping from the lips 103 or overflowing from the cans 50 is caught in the pan 145 from which it is withdrawn through the outlet pipes 146 and 148 by the gear pump 149 (Fig. 13), this gear pump returning the liquid to the overhead reservoir 154 through the pipe 153.

On entering the upper stretch of the conveyer chain 26 the rollers of this chain are engaged by the ridge 161 of the horizontal bar 160 arranged under the upper stretch of this chain. The chain is therefore held in a straightened position while traversing this upper stretch. At the same time the opposite sides of the base plates 85 of the can holders are engaged by the side rails 165, 166 formed at the corresponding end of this bar 160. These side rails serve to hold the can carriers 25 in an upright position upon entering the upper stretch of the chain 26. The cans are prevented from sliding sidewise out from between the base plates 85 and swinging tops 98 of the can carriers by continuations of the rails 194 and 195, as best shown in Figs. 4 and 8.

While passing under the streams of filling liquid falling from the nipples 141 the can carriers pass over the movable track section 170. This track section is set so that its rail 178 is at a substantial elevation over its rail 176. The end of the stationary side rail 165 is provided with the bevel 167 and also the rail 178 is provided with the inclined portion 182 leading to its elevated central portion 179 in such manner that the can carriers ride up onto this elevated portion 179 and assume the tilted position shown in Fig. 9. In this position the maximum amount to which the cans 50 can be filled with the liquid falling from the nipples 141 is up to the lowermost part of the rim of the cans and it will therefore be seen that the setting of the movable track section 170 determine the amount to which the cans 50 are filled with the liquid with which the goods are to be packed. During their passage along the rails of the movable track section 170 the cans are prevented from slipping sidewise out of the can holders by the elevated side rail 198.

After being so filled the bottom plates 85 of the can carriers 25 ride down the incline 183 of the elevated track 178 of the movable track section 170 and also up the bevel 164 of the stationary side rail 162. Thereafter the can holders are supported in an upright position during their continued movement along the upper stretch of the chain 26 by the side rails 162 and 163. The continued movement of the can carriers along these side rails 162 and 163 brings the cans into engagement with the cam face 115 of the bracket 76, this face pushing the cans out of the can holders onto the can discharge wheel 116. When this can discharging is effected the lug 106 is engaged by the elevated part 110 of the side rail 107 so that the swinging top 98 of the can carrier 25 from which a can is being ejected is held in a substantially horizontal position and prevented from cocking or interfering with the free discharge of the can by the cam 115 on the discharge wheel 116. After being emptied the lug 106 of the can carrier drops into the depression 111 of the rail 107 so as to tip the swinging top 98 of the can carrier to the position shown in Fig. 7, thereby to facilitate the feeding of another can into the carrier. This is the position of the parts assumed at the beginning of the description of the operation.

If, for any reason, a can carrier 25 is not filled with a can the swinging top 98 immediately drops to the vertical position show in Fig. 10. When the carrier emerges from the driven sprocket wheel 28 onto the upper stretch of the chain 26, this position of the swinging top 98 of the empty can carrier is again resumed. In this position the swinging top 98 is out of line with the streams of liquid descending from the nipples 141 and hence splattering of the can carriers when so empty is prevented. The swinging tops 98 of the can carriers 25 are brought back from the position shown in Fig. 10 to the tilted position shown in Fig. 7 by the rail 107. For this purpose the lead end 109 of this rail is sufficiently low to catch the lug 105 of such pendant unsecured swinging tops and move the tops to a horizontal position as the can carriers move along. A previously empty can carrier is thereby brought into proper condition in the can filling station to receive a can in the manner illustrated in Fig. 7.

From the foregoing it will be seen that the present invention provides a very simple, high capacity machine for transferring a series of open cans from a feed belt individually into a series of can carriers, the contents of the cans during their retention in the can carriers being thoroughly washed, thoroughly drained and filled, to an amount short of fullness, with the liquid with which the goods are to be packed before the cans are discharged from the machine. The machine is also sturdy in construction and will stand up under conditions of severe and constant use without getting out of order or requiring repair and the machine can readily be kept in the clean and sanitary condition necessary with machines handling foodstuffs.

I claim as my invention:

1. In a machine of the character described, an endless conveyer chain having an upper stretch, a series of can carriers, means for mounting each of said can carriers on said chain including a pivot the axis of which extends generally parallel with the line of movement of said can carriers, means for feeding cans containing the goods to be packed individually to said can carriers, means for filling said cans while on the upper stretch of said conveyer chain with the liquid with which the goods are to be packed, means cooperating with said can carriers while traversing said upper stretch of said conveyer chain for tilting said can carriers about said pivots from an upright position while said cans are filled to provide a predetermined amount of liquid in said cans short of fullness, means for subsequently moving said can carriers to an upright position, and means for subsequently discharging said cans from said can carriers.

2. In a machine of the character described, an endless conveyer chain having an upper stretch, a series of can carriers, means for mounting each

of said can carriers on said chain including a pivot the axis of which extends generally parallel with the line of movement of said can carriers, means for feeding cans containing the goods to be packed individually to said can carriers, means for filling said cans while on the upper stretch of said conveyer chain with the liquid with which the goods are to be packed, a track arranged under the upper stretch of said conveyer chain and engaging said can carriers to determine the inclination thereof about the axes of said pivots, said track including a portion arranged to tilt said can carriers about said pivots from an upright position while said cans are filled to provide a predetermined amount of liquid in said cans short of fullness and with a portion for restoring the can carriers to an upright position, and means for subseqnently discharging said cans from said can carriers.

3. In a machine of the character described, an endless conveyer chain having an upper stretch, a series of can carriers, means for mounting each of said can carriers on said chain including a pivot the axis of which extends generally parallel with the line of movement of said can carriers, means for feeding cans containing the goods to be packed individually to said can carriers, means for filling said cans while on the upper stretch of said conveyer chain with the liquid with which the goods are to be packed, a track arranged under the upper stretch of said conveyer chain and having two side rails engaging said can carriers on opposite sides of said pivots to determine the angular position thereof, said track including a portion adjustably mounted to tilt said can carriers about said pivots from an upright position while said cans are filled to provide a predetermined adjustable amount of liquid in said cans short of fullness, and means for subsequently discharging said cans while traversing another portion of said track.

4. In a machine of the character described, an endless conveyer chain having an upper stretch, a series of can carriers, means for mounting each of said can carriers on said chain including a pivot the axis of which extends generally parallel with the line of movement of said can carriers, means for feeding cans containing the goods to be packed individually to said can carriers, means for filling said cans while on the upper stretch of said conveyer chain with the liquid with which the goods are to be packed, a horizontal bar arranged under the upper stretch of said conveyer chain and parallel therewith, a pair of stationary side rails secured to the opposite ends of said bar and engaging said can carriers on opposite sides of the pivots thereof to support said can carriers in an upright position, a movable track section mounted on said bar intermediate the ends thereof and adjustably rotatable about the axes of said pivots to engage the said can carriers on opposite sides of the pivots thereof to support the can carriers passing thereover in a tilted position while said cans are filled to provide a predetermined adjustable amount of liquid in said cans short of fullness, and means for subsequently discharging said cans while traversing the corresponding pair of said stationary side rails.

5. In a machine of the character described, an endless conveyer chain having an upper stretch, a series of can carriers, means for mounting each of said can carriers on said chain including a pivot the axis of which extends generally parallel with the line of movement of said can carriers, means for feeding cans containing the goods to be packed individually to said can carriers, means for filling said cans while on the upper stretch of said conveyer chain with the liquid with which the goods are to be packed, a horizontal bar arranged under the upper stretch of said conveyer chain and parallel therewith, said bar being formed on its upper side with a longitudinal ridge receiving and supporting said conveyer chain, a pair of stationary side rails secured to the opposite ends of said bar and engaging said can carriers on opposite sides of the pivots thereof to support said can carriers in an upright position, a movable track section mounted on said bar intermediate the ends thereof and adjustably rotatable about the axes of said pivots to engage the said can carriers on opposite sides of the pivots thereof to support the can carriers passing thereover in a tilted position while said cans are filled to provide a predetermined adjustable amount of liquid in said cans short of fullness, and means for subsequently discharging said cans while traversing the corresponding pair of said stationary side rails, said movable track section and the corresponding ends of said stationary side rails being formed to provide a smooth transition of said can carriers from an upright to a tilted position and vice versa.

6. In a machine of the character described, an endless conveyer having upper and lower stretches, a series of can carriers mounted on said endless conveyer and projecting outwardly therefrom, said can carriers each including a base and a foraminous top connected with said base, means for feeding open cans containing the goods to be packed individually into said can carriers, means for filling said cans with the liquid with which said goods are to be packed, comprising a series of nipples arranged over the path of said can carriers on the upper stretch of said conveyer and adapted to drop said liquid into the foraminous tops of said can carriers and means for supplying said series of nipples with said liquid, means for tilting said can carriers while passing under said nipples to fill said cans to a predetermined level short of fullness and means for discharging the cans so filled from said upper stretch of said conveyer.

7. In a machine of the character described, an endless conveyer having upper and lower stretches, a series of can carriers mounted on said conveyer and projecting outwardly therefrom, said can carriers each including a base and a cup shaped foraminous top connected with said base and said top being formed to provide a lip projecting outwardly to one side of the path of said can carriers, means for feeding open cans containing the goods to be packed individually into said can carriers, means for filling said cans with the liquid with which said goods are to be packed, comprising a nipple arranged over the path of said lips on the upper stretch of said conveyer and adapted to drop said liquid into said lips to be conveyed thence through said foraminous tops into said cans and means for supplying said liquid to said nipple and means for discharging the cans so filled from said upper stretch of said conveyer.

8. In a machine of the character described, an endless conveyer having upper and lower stretches, a series of can carriers mounted on said conveyer and projecting outwardly therefrom, said can carriers each including a base,

members rising from said base in the line of movement of said can carriers and a cup shaped foraminous top pivotally secured to the upper ends of said members along an axis generally parallel with said line of movement, each of said tops being formed to provide a lip projecting outwardly to one side of said can carriers, means at a can feeding station along said conveyer for feeding cans containing the goods to be packed individually into said can carriers at one side thereof, means for filling said cans with the liquid with which said goods are to be packed, comprising a nipple arranged over the path of said lips on the upper stretch of said conveyer and adapted to drop said liquid into said lips to be conveyed thence through said foraminous tops into said cans and means for supplying said liquid to said nipple, said lips overbalancing said tops when said can carriers are unfilled with cans to hold said tops in a generally vertical position while traversing the upper stretch of said conveyer with said lips and tops out of the path of the stream of liquid falling from said nipple, means between said can filling means and said can feeding means for discharging the filled cans from said conveyer and means along the path of said can conveyers for restoring the tops of any unfilled can carriers from said vertical position to a generally horizontal position at said can feeding station to permit the feeding of a can therein.

9. In a machine of the character described, an endless conveyer having upper and lower stretches, sprockets supporting the opposite ends of said conveyer, a series of can carriers arranged in spaced relation along said conveyer and projecting outwardly therefrom, each of said can carriers including a base and a top connected to said base to provide an open sided holder into which a can can be inserted, a pivot pin extending longitudinally of the line of movement of said can carriers and connecting each of said bases with said conveyer, means at the upper stretch of said conveyer for feeding cans containing the goods to be processed individually into said can carriers, means at the upper stretch of said conveyer for filling said cans with liquid, means interposed between said can feeding and can filling means for discharging said cans from said can carriers, means for holding said can carriers upright on said conveyer during said feeding and discharge of cans, means for tilting said can carriers during said filling of said cans to provide a predetermined amount of liquid in each of said cans and means for holding said can carriers in a radial position on traversing one of said sprockets, comprising a pair of stationary rails arranged on opposite sides of said sprocket concentrically therewith and engaging said can carriers on opposite sides of said pivot pins.

10. In a machine of the character described, an endless conveyer having upper and lower stretches, sprockets supporting the opposite ends of said conveyer, a series of can carriers arranged in spaced relation along said conveyer and projecting outwardly therefrom, each of said can carriers including a base and a top connected to said base to provide an open sided carrier into which a can can be inserted, a pivot pin extending longitudinally of the line of movement of said can carriers and connecting each of said bases with said conveyer, means at the upper stretch of said conveyer for feeding cans containing the goods to be processed individually into said can carriers, means at the upper stretch of said conveyer for filling said cans with liquid, means interposed between said can feeding and can filling means for discharging said cans from said can carriers, means for holding said can carriers upright on said conveyer during said feeding and discharge of cans, means for tilting said can carriers during said filling of said cans to provide a predetermined amount of liquid in each of said cans and means for holding said can carriers in a radial position on traversing one of said sprockets, comprising a disk mounted on the hub of said sprocket on each side thereof and engaging said can carriers on opposite sides of said pivot pins.

WILLIAM DE BACK.