July 16, 1940. B. S. HARRINGTON 2,208,028

CONTAINER FILLING APPARATUS

Filed Dec. 10, 1938 2 Sheets-Sheet 1

Fig. 1

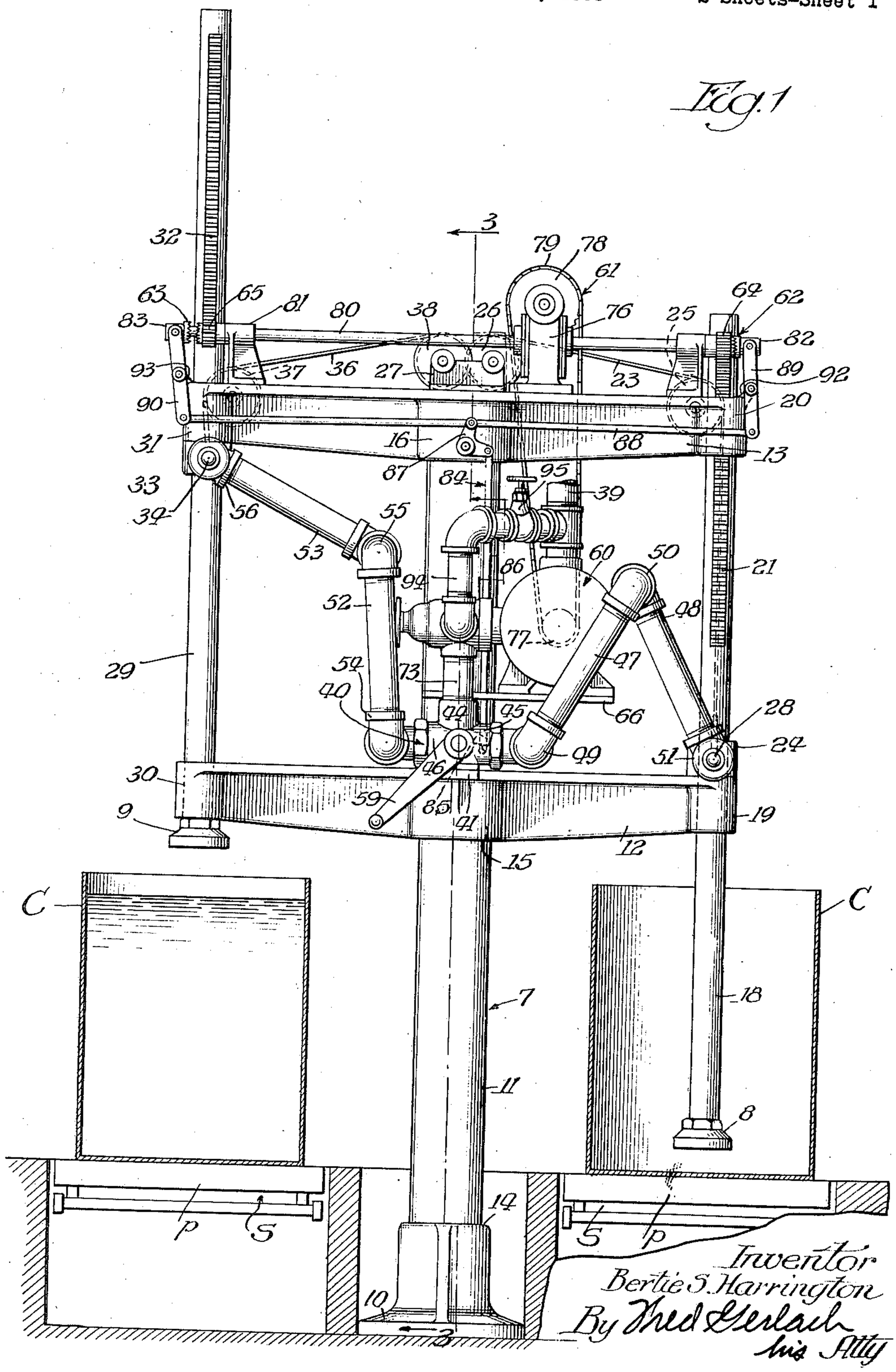


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Fig 2

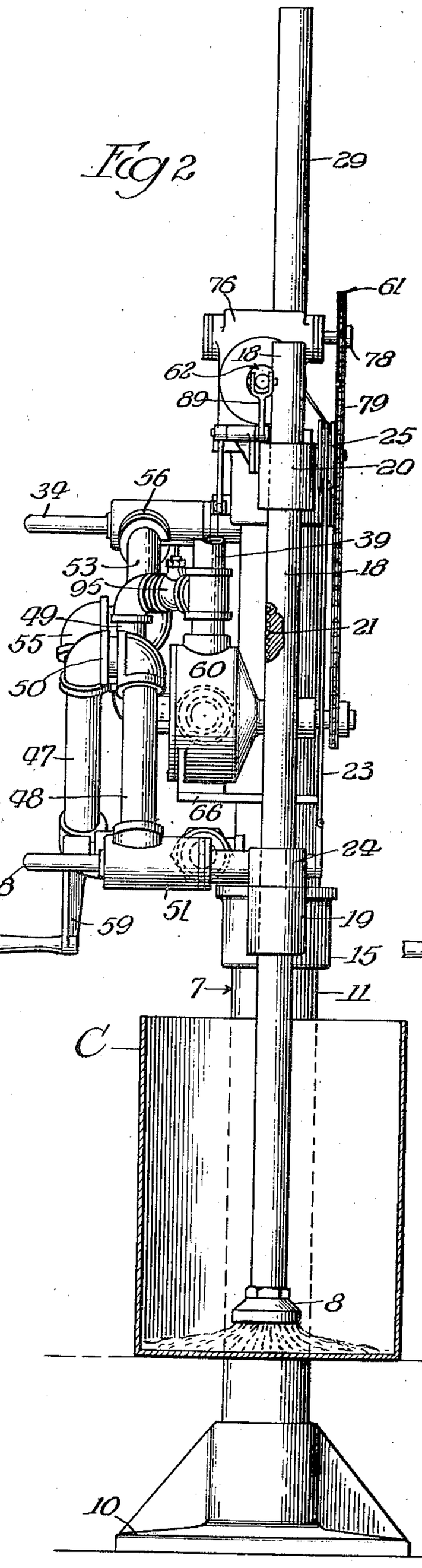



Fig. 3

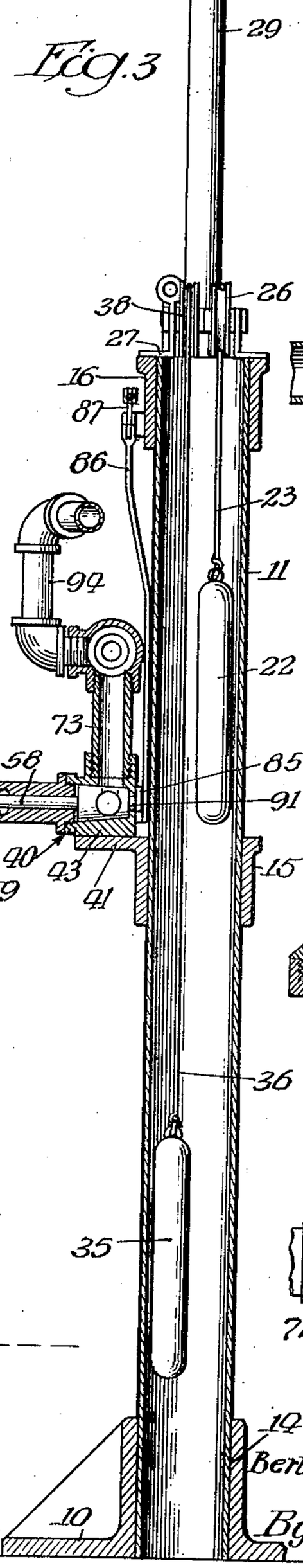



Fig. 4

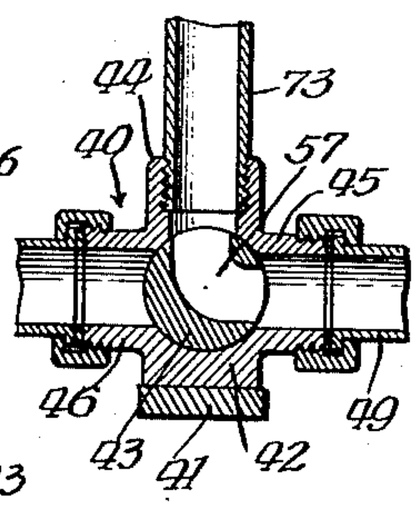



Fig. 5

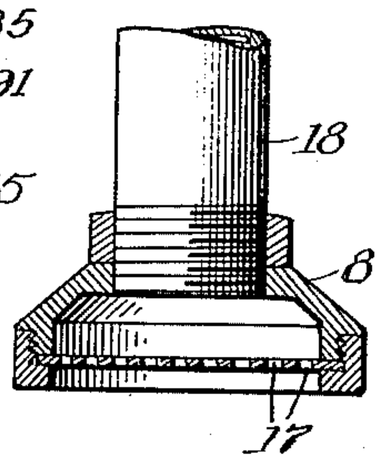
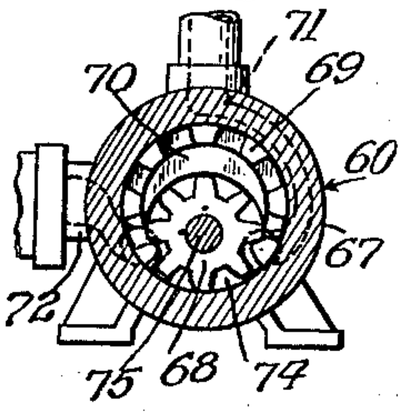



Fig. 6

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Patented July 16, 1940 2,208,028

# UNITED STATES PATENT OFFICE

2,208,028

## CONTAINER FILLING APPARATUS

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Application December 10, 1938, Serial No. 244,881

9 Claims. (Cl. 226—125)

The present invention relates generally to apparatus for filling containers with melted lard, shortening, compound, or other congealable material under pressure. More particularly the invention relates to that type of container filling apparatus which is primarily designed for use in connection with a platform scale or like weighing device and as the main or essential parts thereof comprises: (1) a supporting structure; (2) a discharge nozzle which is mounted on the supporting structure for vertical movement over the platform of the scales and is adapted upon placement of a container on the platform to be lowered into the container and in response to the flow of the material therethrough to direct the material into the container for container filling purposes; (3) mechanism for automatically raising the nozzle as the material is introduced into the container; and (4) valve means whereby the flow of the material through the nozzle into the container may be cut off when the container is filled to the desired extent.

One object of the invention is to provide a container filling apparatus of this type which is generally an improvement upon, and is more efficient and sanitary and produces less voids than, previously designed apparatus for the same purpose by reason of the fact that the nozzle raising mechanism is actuated by the flow of material to the nozzle and operates so to control the nozzle in connection with raising thereof that the nozzle is maintained at a substantially fixed or uniform distance above the level of the material in the container.

Another object of the invention is to provide a container filling apparatus of the last mentioned character in which the automatic nozzle raising mechanism comprises a gear pump through which passes the material under pressure in transit to the nozzle and in addition clutch equipped gearing between the rotor of the pump and the nozzle, and the valve means for controlling the flow of material through the nozzle into the container is so connected to the clutch part of the gearing that when it is closed to cut off the flow of material through the nozzle when the container is filled to the desired extent the clutch is automatically disengaged and the nozzle raising mechanism thus stops.

A further object of the invention is to provide a container filling apparatus of the type and character under consideration which includes a valve controlled by-pass around the pump of the nozzle raising mechanism whereby the speed of upward travel of the nozzle may be adjusted or or controlled in connection with the filling of containers of different sizes.

A still further object of the invention is to provide a container filling apparatus which may be manufactured at a comparatively low and reasonable cost and effectively and efficiently accomplishes its intended purpose.

Other objects of the invention and the various advantages and characteristics of the present container filling apparatus will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a front view of a duplex apparatus embodying the invention, showing one of the nozzles in its lowered position within a container to be filled preliminary to filling such container, and the other nozzle in its raised position at the conclusion of a container filling operation;

Figure 2 is a side view of the apparatus, parts being broken away and shown in section for illustrative purposes;

Figure 3 is a vertical transverse sectional view on the line 3—3 of Figure 1;

Figure 4 is a sectional view of the two-way valve which constitutes the means for controlling the flow of the material and operates when the plug thereof is in one position to permit the material to flow to one of the nozzles and when the plug is in its other position to cut off the flow of material to the one nozzle and permit it to flow to the other nozzle;

Figure 5 is a sectional view of one of the nozzles; and

Figure 6 is a sectional view of the gear pump which forms a part of the automatic material actuated nozzle raising mechanism.

The apparatus which is shown in the drawings constitutes the preferred embodiment of the invention. It is adapted to fill containers C with lard, shortening, compound, or other congealable material under pressure and is what may be termed a "duplex" apparatus. As parts thereof the apparatus comprises a supporting structure 7 and a pair of container filling nozzles 8 and 9. Two containers C are shown in the drawings and these are adapted to be filled successively and then replaced with other containers for filling

purposes. During filling, the two containers C are adapted to be supported by a pair of laterally spaced platform scales S. The latter embody container supporting platforms *p* and enable the operator of the apparatus to fill the containers to a predetermined or desired weight.

The supporting structure 7 is adapted to rest upon the floor of the room or space in which the apparatus is used and embodies a base 10, a standard 11, a lower cross-head 12, and an upper cross-head 13. The base 10 is in the form of a flanged casting. It is disposed midway between the scales S and embodies a vertically extending cylindrical socket 14 for the lower end of the standard 11. The standard is hollow, as shown in Figure 3, and has an open upper end. The lowermost head 12 is in the form of a casting and embodies at the central portion thereof a cylindrical sleeve-like member 15 which extends around and is bolted or otherwise fixedly secured to the central portion of the hollow standard 11. As shown in Figure 1, the lower cross-head is horizontally elongated and is positioned so that the ends thereof overlie the container supporting platforms *p* of the scales S. The upper cross-head 13 is the same in size and design as the lower cross-head 12. It is positioned in overhanging and parallel relation with the lower cross-head and embodies a centrally disposed sleeve-like part 16. This part surrounds and is fixedly secured to the upper end of the standard 11 with the result that the upper cross-head constitutes a fixed part of the supporting structure 7. The nozzles 8 and 9 are positioned over the platforms *p* respectively, as shown in Figure 1. They are adapted alternately to be lowered and raised and embody horizontally extending perforated plates 17 whereby the material is caused to be introduced into the containers in spray form.

The nozzle 8 is located at one side of the supporting structure and is connected to the lower end of a vertically extending rod 18. This rod is carried by a pair of vertically aligned bearings 19 and 20 at the adjacent ends of the lower and upper cross-heads 12 and 13 so that it together with the nozzle 8 is vertically movable. The lower end of the rod is hollow and serves as a conduit for conveying the material to the nozzle 8. The upper end of the rod 18 is solid and embodies a longitudinally extending rack 21. The rod 18 is counterweighted by a counterweight 22 so that it remains stationary except when moved vertically either manually or by power. This counterweight 22 is disposed and vertically movable in the standard 11, as shown in Figure 3, and is connected to the nozzle carrying rod 18 by a cable 23. One end of the cable is connected to and eye at the upper end of the counterweight and the other end of the cable is attached to a laterally extending pin on a fixed collar 24 on the central portion of the rod 18. The central portion of the cable extends over and around a pair of sheaves 25 and 26 on the upper cross-head 13. The sheave 25 is disposed adjacent to the bearing 20 and the sheave 26 is carried by a pair of brackets 27. The sleeve-like part 16 on the central portion of the cross-head is disposed over the upper end of the standard 11. The counterweight is substantially equal in weight to the nozzle carrying rod 18. When the rod is moved downwards the counterweight moves upwards in the standard and when the rod is shifted upwardly the counterweight moves downwards. The collar 24 forms a stop for limiting downward movement of the rod and embodies a forwardly extending handle 28. The latter is adapted to be grasped in connection with manual lowering of the rod. The collar is positioned at such a distance with respect to the nozzle 8 that when it is in abutment with the bearing 19 of the cross-head 12 and the rod is thus restricted against further downward movement the nozzle 8 is disposed a small distance above the platform of the subjacent scale S. The rod 18 is adapted to be lowered manually by the operator of the apparatus to its lowermost position in order to bring the nozzle 8 directly over the bottom of the container on the platform of the subjacent scale, and is then adapted to be raised by power as the container filling material flows through the hollow lower end of the rod and then into the container via the nozzle 8.

The nozzle 9 is connected to the lower end of a vertically extending rod 29. The latter is the same in length and design as the rod 18 and is mounted for vertical sliding movement over the platform of the other scale S by way of a pair of vertically spaced aligned bearings 30 and 31. The bearing 30 is formed as an integral part of the lower cross-head 12 and the bearing 31 is formed as an integral part of the upper cross-head 13. The lower end of the rod 29 is hollow and forms a conduit or duct for conveying the container filling material to the nozzle 9. The upper end of the rod is solid and embodies a rack 32. A collar 33 is fixed to the central portion of the rod 29 and forms a stop for limiting downward movement of the nozzle 9. This collar is spaced from the nozzle 9 a distance equal to the distance between the collar 24 and the nozzle 8 and embodies a handle 34 whereby manual lowering of the rod 29 by the operator of the apparatus is facilitated. The rod 29 is counterweighted like the rod 18 in order that it remains stationary except when moved manually or by power. For purposes of counterweighting the rod 29, a counterweight 35 and a cable 36 are provided. The counterweight 35 is disposed next to the counterweight 22 for the rod 18 and is vertically movable in the standard 11. One end of the cable 36 is anchored to one end of the counterweight 35 and the other end of the cable is attached to a laterally extending pin (not shown) on the collar 33. The central portion of the cable extends over and around a pair of sheaves 37 and 38 on the upper cross-head 13. The sheave 37 is located adjacent to the bearing 31 and the sheave 38 is mounted on the brackets 27 and is disposed over the open upper end of the standard 11.

The material with which the containers C are to be filled is supplied to the nozzles 8 and 9 under pressure by way of a pipe system including a pipe 39 and a two-way valve 40. The pipe 39 is adapted to have the material pumped into it under pressure from a tank or other source of supply (not shown), and is arranged so that the discharge end thereof terminates in front of the supporting structure and between the two cross-heads. The valve 40 is mounted on a laterally extending ear 41 on the sleeve part 15 of the lower cross-head 12. It comprises a casing 42 and a rotatable plug 43 (see Figure 4) and constitutes the control means whereby the flow of the material under pressure through the nozzles may be cut off at the conclusion of the container filling operations. The casing 42 of the valve is in the form of an inverted T and embodies a vertically extending inlet branch 44 and a pair of horizontally extending, oppositely facing outlet branches 45 and 46. The branch 45 extends in

the direction of the bearing 19 and is connected to the collar 24 by a pair of pipe sections 47 and 48. The section 47 is connected at one end thereof to the branch 45 by a flexible joint 49 and is connected at its other end to one end of the pipe section 48 by a flexible joint 50. The other end of the pipe section 48 is connected by a flexible joint 51 to the collar 24 and communicates with the upper portion of the hollow part of the rod 18 by way of said joint 51 and aligned holes (not shown) in the collar and the central portion of the rod. When communication is established between the inlet branch 44 and the outlet branch 45, the material flows to the nozzle 8 via the pipe sections 47 and 48 and the lower end of the rod 18. The flexible joints 49, 50 and 51 permit of ready raising and lowering of the rod 18 without disturbing the flow of material from the valve casing 42 to the nozzle 8. The pipe sections 47 and 48 together with the aforesaid flexible joints 49, 50 and 51 constitute simple means for delivering the material under pressure from the valve casing 42 into the nozzle 8 regardless of the position of the rod 18 with respect to the supporting structure. The outlet branch 46 is connected to the central portion of the rod 29 by way of a pair of pipe sections 52 and 53. The section 52 is connected at one end thereof to the outlet branch 46 by a flexible joint 54 and is connected at its other end to one end of the pipe section 53 by a flexible joint 55. The other end of the pipe section 53 is connected to the collar 33 by a flexible joint 56 and communicates with the upper portion of the hollow part of the rod 29 by way of the joint 56 and aligned holes in the collar and the central portion of the rod. The flexible joints 54, 55 and 56 permit of vertical swinging of the pipe sections 52 and 53 and together with the latter constitute means for permitting the material to flow from the outlet branch 46 of the valve casing 42 to the nozzle 9 regardless of the position of the rod 29 with respect to the supporting structure 7. The plug 43 for the valve is rotatably mounted in the central portion of the valve casing 42 and embodies an L-shaped port 57. When the plug is turned in one direction so as to bring the port 57 into communicating relation with the inlet branch 44 and the outlet branch 45 (see Figure 4) the material flows successively through the pipe section 47, the pipe section 48, the collar 24, and the lower end of the rod 18 to the nozzle 8 and is discharged by the latter into the subjacent container C. When the plug 43 of the valve is rotated 90° in the opposite direction, the port 57 establishes communication between the inlet branch 44 and the outlet branch 46 and the material under pressure is permitted to flow successively through the pipe section 52, the pipe section 53, the collar 33 and the lower end of the rod 29 to the nozzle 9 for container filling purposes. From the foregoing it is manifest that when the plug is shifted in one direction, the material under pressure flows to the nozzle 8 and when it is shifted in the reverse or opposite direction, the material flows to the nozzle 9. When nozzle 8 is effective to discharge the material into the subjacent container, no material flows through the nozzle 9 and vice versa. The plug 43 is provided with a forwardly extending stem 58 and this embodies a crank or handle 59 whereby the valve plug may be readily turned in connection with control of the material to the nozzles. In the operation of the apparatus, the rod 18 is shifted downwardly by the operator in order to bring the nozzle 8 over the bottom of the subjacent container C. The plug 43 of the valve is then turned so as to establish communication between the inlet branch 44 and the outlet branch 45 in order to effect flow of the material under pressure through the nozzle 8. During filling of the container beneath the nozzle 8 the rod 18 is adapted, as hereinafter described, to move upwardly. During filling of the container beneath the nozzle 8 and while the rod 29 is in its uppermost position it is contemplated that an unfilled container C be placed under the nozzle 9 and that after this step the rod 29 be lowered. As soon as the container C is filled to the desired extent, the operator of the apparatus rotates the plug 43 of the valve so as to cut off the flow of material through the nozzle 8 and establish communication between the inlet branch 44 and the outlet branch 46. Upon establishing communication between the last two mentioned branches the material under pressure flows through the lower end of the rod 29 to the nozzle 9 and thence into the container therebeneath.

In addition to the supporting structure 7, the nozzles 8 and 9 and the other parts hereinbefore described, the apparatus comprises power mechanism whereby when the nozzle 8 is operative to effect filling of the subjacent container C the rod 18 is raised at such a rate that the nozzle is maintained at a substantially fixed or uniform distance above the level of the material in the container beneath the nozzle, and when the nozzle 9 is operative to fill the subjacent container the rod 29 is raised at such a rate that the nozzle is maintained at a substantially fixed or uniform distance above the level of the material in the container beneath the nozzle 9. This mechanism comprises a gear pump 60, a chain and sprocket driving connection 61, a pair of clutches 62 and 63, and a pair of pinions 64 and 65. The pump 60 is mounted on a bracket 66 above the lower cross-head 12 and comprises a casing 67, a gear 68, a ring gear 69, and a crescent 70. The casing 67 embodies an inlet 71 and an outlet 72. The inlet is connected to the discharge end of the pipe 39 and the outlet 72 is connected by a pipe 73 to the inlet branch 44 of the valve 40. As a result of the manner in which the inlet and outlet of the gear pump casing are connected, the material under pressure flows through the gear pump casing prior to entering the control valve 40. The flow of the material through the gear pump casing serves to drive the gear 68 and the latter, in turn, and as hereinafter described more in detail, operates to drive the chain and sprocket connection 61. The gear 68 is rotatably mounted in a chamber 74 between and communicating with the inlet 71 and the outlet 72. It is eccentrically disposed in the chamber 74 and is provided with a shaft 75 which projects through and is journaled in a bearing in the rear wall of the gear pump casing 67. The ring gear 69 corresponds in diameter to, and is rotatably mounted within, the chamber 74 and meshes with the gear 68, as shown in Figure 6 of the drawings. The crescent 70 is stationary and fits within and seals the crescent shaped space between the gear 68 and the ring gear 69. When the material under pressure flows through the gear pump casing 67 it traverses the chamber 74 and in passing through the spaces between the teeth of the gear and the ring gear causes the gear together with its shaft 75 to rotate. The chain and sprocket driving connection 61 is connected to and driven by the shaft 75. It operates in

turn to drive a speed reducing unit 76 and consists of a pair of sprockets 77 and 78 and a chain 79. The sprocket 77 is fixedly connected to the outer or projecting end of the shaft 75 and the sprocket 77 is fixed to the drive shaft of the speed reducing unit 77. The chain 79 extends around the two sprockets 77 and 78 and forms a driving connection between the two. The speed reducing unit 76 is mounted on the upper cross-head 13 and embodies a horizontally extending driven shaft 80. The latter overlies and extends parallel to the upper cross-head 13 and is journaled at its end in bearing brackets 81. The pinions 64 and 65 are rotatably mounted on the outer ends of the shaft 80 and mesh with the racks 21 and 32 respectively. They are disposed outwardly of the bearing brackets 81 and are connected for drive by the shaft 80 through the medium of the clutches 62 and 63. The clutch 62 is associated with the pinion 64 and comprises a horizontally shiftable tooth equipped clutch member 82. The latter is slidably mounted on and connected by splines for drive by the shaft 80 and is adapted when shifted inwards to engage outwardly facing teeth on the pinion 64 and clutch said pinion for drive by the shaft. When the clutch member 82 is in its operative position, that is, in clutched relation with the pinion, a driving connection is established between the shaft 80 and the pinion. When this connection is established and the shaft 80 is rotated as a result of drive of the gear 68 of the gear pump by the passage or flow of material under pressure through the pump casing 67, the pinion 64 which is in mesh with the rack 21 operates through the medium of the rack to raise the rod 18 and the nozzle 8. When the container C beneath the nozzle 8 is being filled with the material and the clutch member 82 of the clutch 62 is in its operative position the shaft 18 and the nozzle 8 are raised with the result that the nozzle moves upwardly in spaced relation with the level of the material in the container. By having the nozzle 8 move upwardly a small distance above the level of the material in the container under the nozzle voids in the material are eliminated and an effective and efficient filling of the container results. The gearing comprising the pinion 64, the rack 21, the speed reducing unit 76 and the chain and sprocket driving connection 61 is such that for a container of a given size the nozzle 8 raises at such a rate that it is spaced a uniform distance above the level of the material in the container beneath the nozzle 8 at all times during a filling operation. The clutch 63 is associated with the pinion 65 and comprises a horizontally shiftable clutch member 83. This member embodies inwardly facing clutch teeth and is slidably mounted on and connected by splines for drive by the shaft 80, and is adapted when shifted inwards to engage outwardly facing teeth on the pinion 65 and form a driving connection between this pinion and the shaft 80. When this connection is established and the shaft 80 is rotated as the result of the flow of the material under pressure through the gear pump 60, the pinion 65 which is in mesh with the rack 32 on the upper end of the rod 29 operates to raise the rod together with its nozzle 9. When the container C beneath the nozzle 9 is being filled the clutch member 83 of the clutch 63 is shifted into its clutched position with the pinion 65 with the result that the nozzle 9 is automatically raised during the container filling operation. When the clutches 62 and 63 are in their unclutched position the rods 18 and 29 are free so that they may be shifted downwardly by manual manipulation.

In order automatically to shift the clutch 62 into its clutched position when the control valve 40 is manipulated to effect flow of material under pressure to the nozzle 8 and to shift the clutch 63 into its operative position when the valve is manipulated to effect flow of the material to the nozzle 9 in connection with filling of a container beneath the last mentioned nozzle, a linkage 84 is provided. This linkage comprises an arm 85, a vertically extending link 86, a bell crank 87, a horizontally extending link 88, and a pair of clutch shifting levers 89 and 90. The arm 85 is connected to, and projects radially from, a stem 91 on the plug 43 of the control valve 40. The link 86 is pivotally connected at its lower end to the distal end of the arm 85, and is pivotally connected at its upper end to one arm of the bell crank 87. The bell crank, as shown in Figure 1, is pivotally connected to the sleeve-like part 16 of the upper cross-head 13. The other arm of the bell crank is pivotally connected to the central portion of the link 88. The clutch shifting lever 89 is pivotally connected to a bracket 92 on the bearing 20 and has a fork at one end thereof whereby it is pivotally connected to the clutch member 82 of the clutch 62. The other end of the lever 89 is pivotally connected to the contiguous end of the link 88. When the plug 43 on the control valve 40 is turned so as to establish communication between the inlet branch 44 and the outlet branch 45 of the valve the arm 85, the link 86, the crank 87 and the link 88 so shift the clutch shifting lever 89 that the clutch 62 is brought into its operative position. The clutch shifting lever 90 is associated with the clutch 63 and is pivotally connected to a bracket 93 on the bearing 31. This lever extends vertically and is provided at its upper end with a fork whereby it is pivotally connected to the clutch member 83 of the clutch 63. The lower end of the lever 90 is connected to the contiguous or adjacent end of the link 88. When the plug 43 of the control valve 40 is shifted to establish communication between the inlet branch 44 of the valve casing and the outlet branch 46 in connection with filling of a container beneath the nozzle 9, the arm 85, the link 86, the bell crank 87 and the link 88 so shift the lever 90 as to bring the clutch 63 into its operative or clutched position. By having the clutch shifting levers 89 and 90 cross-connected by the link 88 of the linkage 84 one of the clutches is rendered operative and the other inoperative. When the plug 43 of the control valve is shifted in one direction one clutch is rendered inoperative and the other operative. When the plug is rotated in the opposite direction the one clutch is rendered operative and the other clutch inoperative. The linkage 84 exemplifies or constitutes simple means for clutching the pinion 64 for drive by the shaft 80 when the valve 40 is manipulated to effect discharge of the material under pressure through the nozzle 8 and for clutching the pinion 65 for drive by the shaft 80 when the valve 40 is manipulated to effect flow of the material under pressure to the nozzle 9.

In order to adjust or control the upward travel of the nozles 8 and 9 in connection with the filling of containers of different sizes, a valve controlled by-pass 94 around the gear pump 60 is provided. This by-pass extends between the pipes 39 and 73 and includes a control valve

95. When the valve is open a portion of the material under pressure is by-passed around the pump. When it is desired to fill large containers, that is, containers having a large diameter, the valve 95 is opened. This results in a reduced drive of the pump 60 and a corresponding diminution of the rate of upward travel of the nozzles. When it is desired to fill containers having a small diameter the valve 95 is closed or partially closed. This results in greater flow of the material under pressure through the pump 60 and a corresponding increase in the rate of upward travel of the nozzles. By adjusting the valve 95 the speed of upward travel of the nozzles may be controlled so that it harmonizes with the inflow of material into the containers. When the valve is properly adjusted the nozzles will raise, in connection with container filling operations, at such a rate of speed that the nozzles will be uniformly spaced at all times above the level of the material in the containers.

The operation of the apparatus is as follows: Assuming that there are two containers on the platforms *p* of the scales S and it is desired to fill the containers, the operator of the apparatus first moves downwardly the nozzle equipped rod 18 in order to bring the nozzle a slight distance above the bottom of the container beneath such nozzle. After this step, the operator manipulates the control valve 40 so as to effect communication between the inlet branch 44 of the valve casing and the outlet branch 45. During shift of the valve as aforesaid, the clutch 62 is shifted into its clutched position with respect to the pinion 64 and a driving connection is established between the pinion and the shaft 80. As material under pressure flows through the pump 60 the valve 40 and the nozzle 8, the rod 18 and the nozzle are caused automatically to raise, as hereinbefore described. While the container beneath the nozzle 8 is being filled the operator moves downwardly the rod 29 in order to bring the nozzle 9 into a position over the bottom of the subjacent container. When the container beneath the nozzle 8 is filled to the desired extent, the operator by swinging the crank 59 rotates the plug 43 of the control valve 40 so as to cut off communication between the inlet branch 44 and the outlet branch 45 of the valve casing and establish communication between the inlet branch and the outlet branch 46. In connection with this control movement of the valve 40 the clutch 62 is shifted into its inoperative position and the clutch 63 is shifted into its operative position wherein a driving connection is established between the pinion 65 and the rack 32. During flow of the material under pressure through the nozzle 9 into the subjacent container the rod 29 together with the nozzle is raised, as hereinbefore described.

In the event that the nozzles do not travel upwardly in proper timed relation with the flow of the material into the containers it is only necessary for the operator to manipulate the valve of the valve-controlled by-pass 94.

The herein described apparatus may be built at a comparatively low cost and effectively and efficiently fulfills its intended purpose. It is simple in design and is characterized by the fact that with the present nozzle raising mechanism any increase or decrease in the rate of flow of the material under pressure results in a corresponding increase or decrease in the upward rate of travel of the nozzles.

Whereas the invention has been described in connection with a duplex container filling apparatus, it is to be understood that it may be embodied in a single apparatus, that is an apparatus embodying a single nozzle. It is also to be understood that the invention is not to be restricted to the details set forth since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a container filling apparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move into and out of the container, means for flowing material under pressure to the nozzle for container filling purposes when the nozzle is in the container, and means actuated by the material during flow thereof to the nozzle for withdrawing the nozzle from the container during a container filling operation.

2. In a container filling apparatus of the character described, the combination of a supporting structure, a counterweighted nozzle mounted on the structure to slide vertically into and out of the container and adapted manually to be lowered into the container, means for flowing material under pressure to the nozzle for container filling purposes upon lowering of the nozzle into the container, and means actuated by the material during flow thereof to the nozzle for raising the nozzle during a container filling operation.

3. In a container filling apparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move into and out of the container, pipe means for flowing material under pressure to the nozzle for container filling purposes when the nozzle is in the container, and means including a rotary device driven by the material in transit through the pipe means to the nozzle for withdrawing the nozzle from the container during a container filling operation.

4. In a container filling apparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move vertically into and out of the container and adapted manually to be lowered into the container, pipe means for flowing material under pressure to the nozzle for container filling purposes upon manual lowering of the nozzle into the container, and means including a rotary device connected to the pipe means and driven by the material in transit through said means to the nozzle for raising the nozzle during a container filling operation.

5. In a container filling aparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move into and out of the container, valve controlled means for flowing material under pressure to the nozzle for container filling purposes when the nozzle is in the container, and means operative automatically upon opening of the valve and actuated by the material during flow thereof to the nozzle for withdrawing the nozzle from the container during a container filling operation.

6. In a container filling apparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move into and out of the container, valve controlled means for flowing material under pressure to the nozzle for container filling pur-

poses when the nozzle is in the container, means operative in response to flow of the material to the nozzle for withdrawing the nozzle from the container during a container filling operation, including a clutch adapted when engaged to render said means effective, and means for automatically engaging the clutch and rendering the withdrawing means operative upon opening of the valve.

7. In a container filling apparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move into and out of the container, valve controlled pipe means for flowing material under pressure to the nozzle for container filling purposes when the nozzle is in the container, means for raising the nozzle during a container filling operation comprising a rotary device adapted to be driven by the material in transit through the pipe means to the nozzle, a control clutch between the device and the nozzle adapted when engaged to render the withdrawing means operative and when disengaged to permit manual lowering of the nozzle, and means for automatically engaging the clutch upon opening of the valve.

8. In a container filling apparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move into and out of the container, means for flowing material under pressure to the nozzle for container filling purposes when the nozzle is in the container, means operative in response to flow of the material to the nozzle for withdrawing the nozzle from the container during a container filling operation, and means for varying the speed of withdrawal of the nozzle.

9. In a container filling apparatus of the character described, the combination of a supporting structure, a nozzle mounted on the structure to move into and out of the container, pipe means for flowing material under pressure to the nozzle for container filling purposes when the nozzle is in the container, means including a rotary device connected to the pipe means and driven by the material in transit through said pipe means to the nozzle for raising the nozzle during a container filling operation, and means for varying the speed of withdrawal of the nozzle comprising a valve controlled by-pass in the pipe means and around the rotary device.

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