

Jan. 21, 1941.

H. REICHLÉ

2,229,476

FILLING MECHANISM

Filed Feb. 4, 1939

4 Sheets-Sheet 2

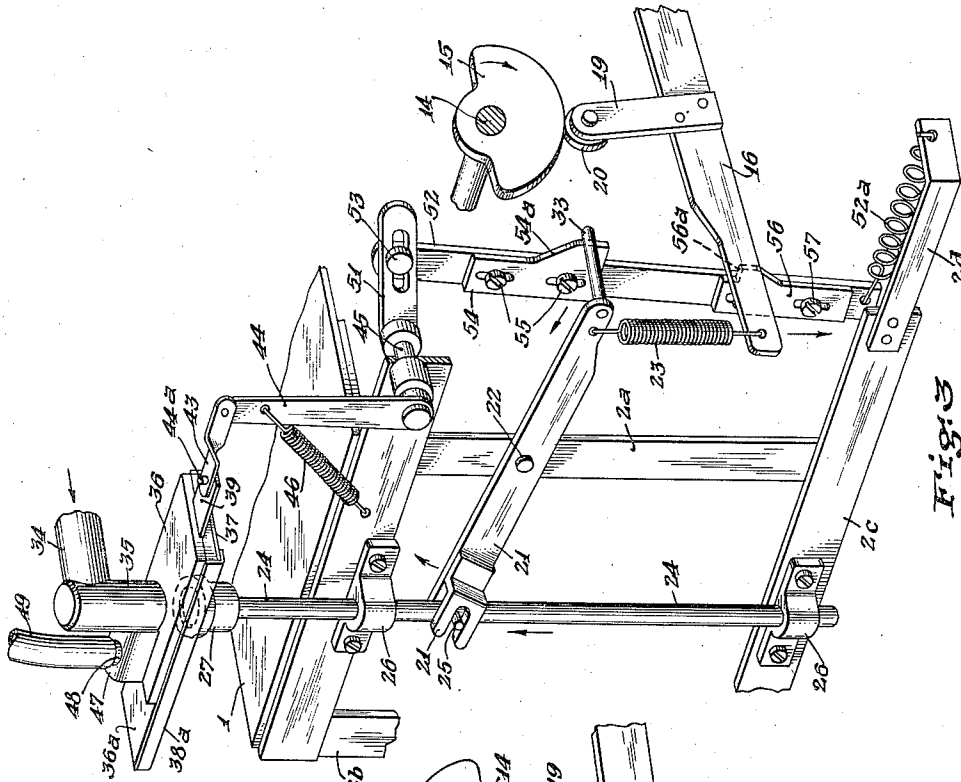


Fig. 3

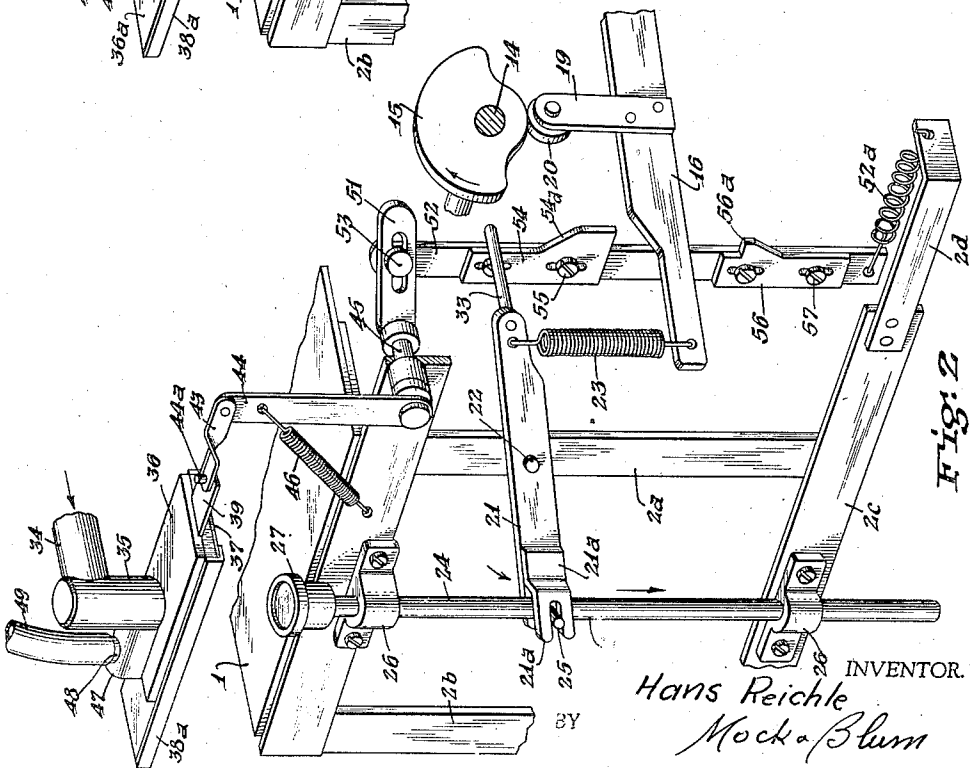


Fig. 2

INVENTOR.
Hans Reichle
Mock & Blum
ATTORNEYS

Jan. 21, 1941.

H. REICHLE

2,229,476

FILLING MECHANISM

Filed Feb. 4, 1939

4 Sheets-Sheet 4

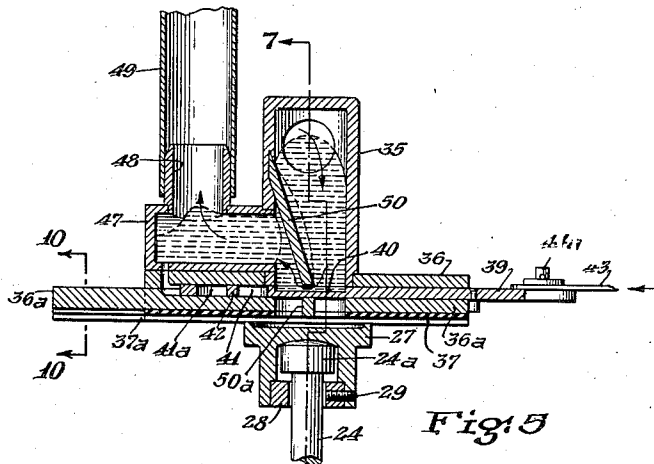


Fig. 5

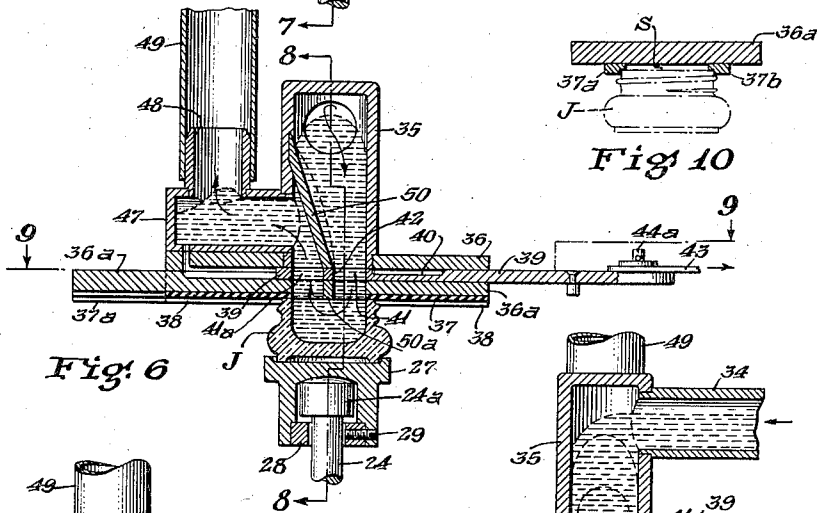


Fig. 6

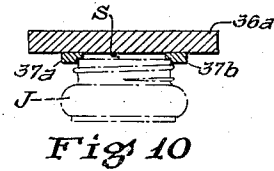


Fig. 10

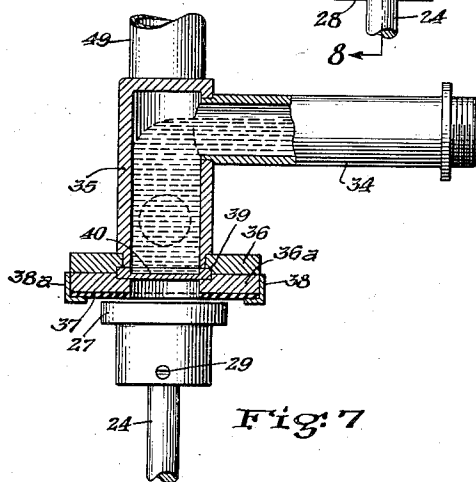


Fig. 7

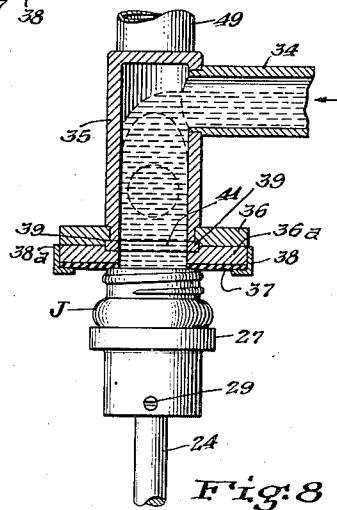


Fig. 8

INVENTOR.
Hans Reichle
Mock & Blum
ATTORNEYS

BY

UNITED STATES PATENT OFFICE

2,229,476

FILLING MECHANISM

Hans Reichle, New York, N. Y., assignor to
Northam Warren Corporation, New York, N. Y.,
a corporation of New York

Application February 4, 1939, Serial No. 254,583

6 Claims. (Cl. 226—113)

This invention relates to new and improved filling mechanism.

The invention relates particularly to filling jars or other receptacles with regulated quantities of cold cream or similar material, so that each receptacle receives a predetermined and regulated quantity of the cream or other material, preferably just enough to fill the jar or other receptacle.

Another object of the invention is to provide nozzle-means for depositing the cream or other material into the receptacle, together with a by-pass which by-passes the cream or other material from the receptacle, as soon as the predetermined regulated quantity has been deposited into the receptacle, preferably up to its top.

Another object of the invention is to provide a nozzle with a by-pass which is always open, so that after a predetermined quantity of the material has been deposited into the jar, the continuously flowing material is fed back to the hopper or magazine through the by-pass, without overfilling the jar or other receptacle.

Another object of the invention is to provide a combination of a filling nozzle having a by-pass, together with a reciprocating support for the jar or other receptacle, said nozzle having a valve which remains closed, unless the support, together with the receptacle thereon, is moved into filling position. Therefore the valve of the nozzle is not open, even if the support is in proper position, unless a receptacle is properly located on said support.

Other objects of the invention are to provide simple and efficient automatic controls for the purposes above mentioned.

Other objects of the invention will be stated in the annexed description and drawings which illustrate a preferred embodiment thereof, it being understood that the above general statement of the objects of the invention is intended generally to explain the main purposes thereof, without limiting the invention in any manner.

Fig. 1 is a side elevation of the improved machine.

Fig. 2 is a detail perspective view, showing the receptacle-support, together with some of the auxiliary controls. In this view the receptacle is not shown in position upon the support, and the receptacle-support is in its extreme bottom position.

Fig. 3 is a view similar to Fig. 2, showing the receptacle-support in its extreme top position.

Fig. 4 is a view similar to Fig. 3, showing a receptacle in position on the receptacle-support,

and illustrating the actuation of the automatic control means, when the receptacle is in said position, and the receptacle-support is moved to filling position.

Fig. 5 is a cross-sectional view of the nozzle and the by-pass and other auxiliary parts. The position of the receptacle-support in Fig. 5 is the same as the position thereof shown in Fig. 3.

Fig. 6 is a sectional view similar to Fig. 5, but corresponding to Fig. 4, in which a receptacle is shown as located on the receptacle-support.

Fig. 7 is a sectional view, partially in elevation, on the line 7—7 of Fig. 5.

Fig. 8 is a sectional view on the line 8—8 of Fig. 6.

Fig. 9 is a sectional view on the line 9—9 of Fig. 6.

Fig. 10 is a sectional view on the line 10—10 of Fig. 5.

The device comprises a table 1, which is mounted on suitable standards. A rigid frame which includes the members 2a, 2b, 2c, and 2d, depends from the table 1, for supporting various parts of the apparatus, as will be later more fully described. A feed-screw casing 4 is mounted upon the table 1. A magazine or hopper 3, which contains the cold cream or other material which is to be packed, is mounted upon the casing 4.

The feed screw which is located within the casing 4 is not illustrated, as it is of conventional design. The machine itself may be largely of conventional design, with the improved parts applied thereto as an attachment.

The casing 4 of the feed-screw is provided with an outlet valve 30. This outlet valve 30 is provided with the usual arm 31, which is connected to a link 32. When the valve 30 is open, the material is discharged into a nozzle-pipe 34, which has a depending nozzle 35. As shown in Figs. 5 and 6 for example, the nozzle 35 is provided with a partition 50. A by-pass is provided between the hopper 3 and the nozzle 35. This by-pass includes a pipe 49 which can be made of any suitable material, rigid or flexible. The pipe 49 is preferably made of flexible rubber. As shown in Figs. 5 and 6, the bottom end of said pipe 49 is connected to the coupling-nipple 48 of a by-pass pipe 47, which is suitably connected to the nozzle 35.

The nozzle 35 is provided with a plate valve 39, which is shown in detail in Fig. 9. This plate valve 39 is provided with a by-pass recess 40 which is preferably of circular shape. This recess 40 does not extend through the valve plate 39. Said plate valve 39 is provided with spaced

filling openings 41 and 41a, which are separated by an intermediate partition 42.

When the plate valve 39 is in the normally closed position illustrated in Fig. 5 and the valve 30 is open, the feed screw forces the cold cream or other material under and around the bottom wall of the partition 50, through the recess 40. In said normally closed position the bottom end-wall of the partition 50 is perpendicular to the longitudinal axis of the plate valve 39, and said bottom end-wall of the partition 50 is diametrically located relative to recess 40.

When the plate valve 39 is in the open position illustrated in Fig. 6, the bottom end-wall of the partition 59 then registers with the partition 42. If the valve 30 is open, the feed screw forces the material through the opening 41 and through an aligned opening of plate 36a into the jar J, and excess cream or other material is forced out of said jar J through the opening 41a, and through an aligned opening of plate 36a, and into the by-pass.

As shown in Figs. 4 and 9, a link 43 is pivotally connected to the plate valve 39 by means of a pivot pin 44a.

As shown in Fig. 4, the link 43 is pivotally connected to an arm 44 which is suitably connected to a pin 45. Said pin 45 is turnably mounted in a bearing which is connected to the frame which depends from the table 1. A tension spring 46 normally holds the plate valve 39 in the closed position which is illustrated in Fig. 5. An arm 51 is suitably connected to the pivot pin 45, so that the arm 44 and arm 51 turn in unison. A depending arm 52 is turnably connected to the arm 51, by means of a pivot pin 53 which is adjustable in a slot of the arm 51. A spring 52a holds the arm 52 yieldingly in the normal position shown in Fig. 2. Said spring then keeps pin 33 in contact with the vertical wall of cam plate 54. Said cam plate 54 is adjustably connected to the depending arm 52 by means of screws 55. A second cam member 56, which has a nose 56a, is adjustably connected to the depending arm 52 by means of screws 57.

The jar or other receptacle J is mounted upon a receptacle-support 27, which is moved up and down by means of a vertically slidable rod or plunger 24. Said plunger 24 moves in slide bearings 26 which are connected to the frame which depends from the table 1. A horizontal pin 25 is rigidly connected to the rod or plunger 24. A lever 21 is pivotally connected at 22 to a depending rod 2a of the aforesaid frame. Said lever 21 has an end-member 21a. Said member 21a has a slot in which said pin 25 is located. Hence when the lever 21 is oscillated, it reciprocates the rod or plunger 24 and the support 27.

As shown in Fig. 5, the support 27 has a recess at its underside. The rod 24 is provided with a collar 28. Said collar 28 is connected by means of a screw 29 to the support 27. There is a slight clearance between the bore of the collar 28 and the rod 24. The rod 24 has a head 24a which is located in the recess which is provided at the underside of the support 27. The diameter of said head 24a is greater than the diameter of the bore of collar 28. Hence the support 27 can move vertically relative to the rod 24, through a short predetermined distance. The support 27 can also turn freely relative to the longitudinal axis of the rod 24, and said support 27 can also tilt slightly relative to the rod 24.

This enables the jar J to be correctly positioned relative to the resilient plate 37. Said

resilient plate 37 may be made of rubber or other resilient material. It is provided with an opening which is aligned with the mouth of the nozzle 35.

Said resilient plate 37 is connected to the metal plate 36a by means of parallel angle plates 38 and 38a. Said metal plate 36a is connected to a companion metal plate 36 by welding or by any other suitable means. The plates 36 and 36a comprise the casing for the plate valve 39. These plates 36 and 36a have recesses which form a guide for the sliding movement of plate-valve 39. Casing plate 36 has an opening to receive the mouth of nozzle 35. Plate 36a has openings which register with openings 41 and 41a, when valve plate 39 is in the open position. Plate 36a also has a partition 50a which registers with partition 42, when plate-valve 39 is in the open position.

The shaft of the feed screw is provided with a sprocket 5, which is connected by means of a chain 6 to a companion sprocket 7, which is keyed to the drive shaft 8. The drive shaft 8 has a pulley 9 which is driven by a belt 10 from any suitable source of power. The drive shaft 8 has a bevel gear 11 which meshes with a larger bevel gear 12, which is keyed to the shaft 14. The cam 15 is keyed to said shaft 14. The periphery of the cam 15 abuts the periphery of a roll 20, which is turnably connected to the extension 19 of a lever 16. Said lever 16 is pivotally connected at 17 to a depending arm 18 which is connected to the table 1. A spring 23 connects the adjacent ends of the levers 21 and 16.

The link 32 may be operated by a suitable cam which is provided on said shaft 14.

The lever 21 has the pin 33 fixed thereto, and said pin 33 has its longitudinal axis perpendicular to the longitudinal axis of said lever 21. Said pin 33 is adapted to contact slidingly with the inclined face 54a of the cam plate 54, as well as with the upstanding face of said cam plate 54.

The operation of the device is as follows:—

If a receptacle J is not located on the support 27, the feed screw is operated continuously by the power shaft 8, which is driven continuously when it is connected to its source of power by a releasable clutch (not shown). The support 27 is therefore moved from the extreme bottom position shown in Fig. 2 to the extreme top position shown in Fig. 3, by means of the cam 15, the lever 21, and the other parts illustrated herein.

Referring to Fig. 1, the cam 15 operates to turn the lever 16 counterclockwise so as to actuate the lever 21 and to raise the rod 24 and the support 27. The support 27 then abuts the underside of the yielding and resilient plate 37. The pin 33 then slides across the inclined wall 54a of the cam 54, so as to turn the arm 52 relative to the arm 51, and the lever 16 therefore skips the nose 56a of the member 56 during the turning movement of said lever 16, as shown in Fig. 3. The spring 46 therefore maintains the member 44 and the member 43 in the positions illustrated in Figs. 2 and 3, in which the plate valve 39 is in the closing position.

Hence, although the valve 30 is opened automatically when the support 27 is in its top position, the feed screw continuously feeds the material only into the by-pass.

When a receptacle J is in position, as illustrated in Fig. 4, the top highest position of the support 27 is below the top position shown in Fig. 3. The pin 33 therefore does not contact with

the inclined wall 54a. The spring 23 is extended, so as to provide lost motion between members 16 and 21. Hence the lever 16 strikes the nose 56a, so as to rock pin 45 and thus move the plate valve 39 to its open position. The jar J is therefore automatically filled up to the level of the underside of the plate 37.

In this particular embodiment, the operator holds the jar J in the position shown in Fig. 6, until the rod 24 has descended sufficiently and the plate valve 39 has been moved to the closing position. As shown in Fig. 10, plate 36a has flanges 37a and 37b. These flanges are shaped so as to prevent contact with plate 36a and the mouth of the jar, when the mouth of the jar is slid along said flanges.

It would not be departing from the invention if automatic means were provided for holding the jar J in position until the plate valve 39 was moved to the closing position, and for subsequently moving the jar J away from the filling position.

While the invention is particularly useful for filling receptacles with cold cream or other cosmetic creams or plastic material, the invention can also be used in connection with any kind of material.

The valve 39 may remain open continuously during the operation of the apparatus, it being sufficient to provide a manual control for said valve 39, so that said valve can be closed when the device is not in use.

When the clutch which connects the apparatus to its drive is opened, the feed screw is inoperative and valve 30 is closed and support 27 is in its bottom position.

By means of the improved mechanism, the material is forced into the receptacle until the receptacle is filled, and the flowing material is then by-passed while the receptacle is maintained in filling position. The material enters the nozzle 35 at the top thereof, and said material is then forced downwardly, as shown by one of the arrows in Fig. 6. The partition 50 deflects the downwardly flowing material to the opening 41, and the momentum of the downwardly flowing material causes it to enter the receptacle, through a part of the mouth of said receptacle. The air in the receptacle can escape freely through the other part of the mouth of said receptacle. When the receptacle has been filled, the material continues to flow through the receptacle to the by-pass, without changing the level of the material into the receptacle. When the plate valve 39 is closed, the cream or the like has sufficient adhesion to the walls of the openings in plate 36a, and also to the wall of the opening in plate 37, to remain in said openings. The diameter of the opening in plate 37 is preferably a little smaller than the diameter of the mouth of the jar. The material which leaves the jar moves upwardly, in order to enter the by-pass. Said material fills the pipe 49, and the height of the material in said pipe 49 is sufficient to create the necessary back-pressure, so that the flowing material is forced to fill the jar. The outlet end of pipe 49 is preferably located above the level of the material in hopper 3. If cold cream is being packed, it has enough viscosity and adherence to the wall of pipe 49, to cause the pressure of the feed screw to force the material into the jar.

The filling period is preferably slightly greater than the time which is required to fill a receptacle, so that some of the material flows through

the filled receptacle before the plate valve 39 is moved to the closing position. Whenever I refer in a claim or claims to filling a receptacle, I include the forcing of material into a receptacle up to a predetermined level below its mouth, even though the receptacle is not completely filled. The force of gravity (instead of a feed screw or the like) may be used for forcing the material into the receptacle.

The pipe 49 is not necessarily connected to the feed hopper 3. It may be connected to a different reservoir. Hence the designation "by-pass" is not limited to a method or device whereby excess material is redelivered to the reservoir from which said material was withdrawn.

After the jar has been filled and while the support 27 is in the filling position or after the support 27 has moved a trifle below said filling position, the jar J is slid relative to the plate 37 until the mouth of said jar is located slidably between the flanges 37a and 37b. The edge-wall of the opening in the plate 37 then acts as a wiping element so that the jar is filled to its top, and little or none of the material is smeared along the face of the plate 37. The plate 37 is compressed to some extent when the jar is in filling position. The shoulders of the flanges 37a and 37b guide the sliding movement of the jar J, relative to the metal plate 36a, so that there is a slight space S between the mouth of the jar and the underside of the plate 36a. Therefore the material is not smeared along the underside of the metal plate 36a, even if any part of the mass of material extends slightly above the top of the jar J. The purpose of the partition 50 is to provide a nozzle 35 with a filling opening which is smaller than the mouth of the jar. The invention therefore includes any type of filling nozzle whose mouth is smaller than the mouth of the jar. In the embodiment described herein, the control member 52 of the valve-operating mechanism can move freely away from the path of movement of the arm 16 of the mechanism which actuates the receptacle support, when a receptacle is not located on said receptacle support. When a receptacle is located on said receptacle support, said control member 52 is held in the path of movement of arm 16, so that control member 52 is actuated by arm 16, and the valve-operating mechanism then opens the valve.

I have shown a preferred embodiment of my invention but it is clear that numerous changes and omissions can be made without departing from its spirit.

For example, the well-known filling machine has piston-means, in addition to or in place of a feed screw, for forcing the material into the receptacles. Such additional or other feeding means can be used in my invention. The feed of the material may be continuous or intermittent.

In order to identify the invention in the claims, certain terms which are used in the claims are defined as follows:

The valve is movable to the open position which is shown in Fig. 6, and it is biased by the spring 46 to the normally closed position which is shown in Fig. 5. As shown in Fig. 5, the valve is shaped to permit material to flow through a part of said valve, namely, the recess 40, to the by-pass pipe 49 when the valve is in the closed position shown in Fig. 5. The receptacle support 27 holds the mouth of the receptacle J against the outlet of the filling-nozzle when said support 27 is in the predetermined position shown in Fig. 4.

The plunger 24 of the receptacle support 27 is connected to the operating device 16 by connecting means which include the first spring 23. The members 16, 23 and 21 normally move the receptacle support 27 beyond the predetermined position which is shown in Fig. 4, to the position shown in Fig. 3. However, when a receptacle J is located on the support 27, the spring 23 yields, as can be seen by comparing Figs. 3 and 4, and the receptacle support 27 is then urged by the spring 23 towards the outlet of the filling nozzle, beyond the predetermined position which is shown in Fig. 4. However the receptacle J then prevents the movement of the receptacle support 27, beyond said predetermined position. The valve has valve-operating means 44 which are adapted to be actuated by the operating member 16. The valve is biased to the normally closed position which is shown in Fig. 5, by means of the spring 45. Second connecting-means are provided between the valve-operating device 44 and the operating device 16. Said second connecting means include the control member 52 which is movable to the operative position shown in Fig. 4 and which is also movable to the inoperative position shown in Fig. 3.

The control member 52 is biased to the operative position, by means of the spring 52a. The pin 33 is movable in unison with the plunger 24 of the receptacle support 27. As shown in Figs. 3 and 4, the control means 33 move the control member 52 to its operative position only when the receptacle support 27 is moved beyond the predetermined position shown in Fig. 4. Likewise the member 16 is adapted to actuate the valve-operating means 44 only after the receptacle support 27 has reached said predetermined position.

Complete automatic means are therefore provided whereby the valve is opened without the exertion of any pushing force by means of the receptacle J.

I claim:

1. In combination, a nozzle, means adapted to force material into said nozzle, said nozzle having an outlet, said nozzle having a partition which divides said outlet into a plurality of outlet-ports, a by-pass pipe connected to said nozzle, said by-pass pipe having an inlet which is spaced from the outlet of the nozzle, a plate valve, a casing in which said plate valve is slidably located, said plate valve having a plurality of spaced openings which are separated by intermediate partition means, said plate valve being movable to an open position in which the openings of said plate valve respectively register with the outlet portions of the nozzle and the partition means of the plate valve register with the partition of the nozzle, said plate valve also having a recess, the end of the partition of the nozzle overlying said recess when said plate valve is in a closed position, said valve casing having an outlet which is provided with an auxiliary partition, said auxiliary partition being in registration with said partition means when the plate valve is in its open position.

2. A filling machine comprising a filling-nozzle which has an outlet, a by-pass pipe connected to said filling-nozzle, a movable valve associated with said filling-nozzle and adapted to control said outlet, said valve being movable to an open position and to a closed position and being biased to a normally closed position, said valve being shaped to permit material to flow through a part of said valve from said filling-nozzle to said by-

pass pipe when the valve is in closed position, a receptacle-support which is movable towards said outlet and away therefrom and adapted to hold the mouth of a receptacle against said outlet in a predetermined position of said receptacle-support, operating-mechanism connected to said receptacle-support by first connecting-means which include a spring, said operating-mechanism and said first connecting-means being adapted to normally move said receptacle-support beyond said predetermined position when the receptacle-support is free from a receptacle, said spring yielding when a receptacle is located on said receptacle-support and said receptacle-support is urged towards said outlet beyond said predetermined position, operating means adapted to be actuated by said operating-mechanism to open said valve, second connecting-means between said valve-operating means and said operating-mechanism, said second connecting-means including a control member which is movable to an operative position and also to an inoperative position relative to said operating-mechanism, so that the valve is opened by the operating-mechanism only when said control member is in its operative position, biasing means biasing said control member to its operative position, said receptacle-support having control-means operable in unison therewith and adapted to move said control member to its inoperative position only when said receptacle-support is moved beyond said predetermined position, said operating-mechanism being adapted to actuate said valve-operating means only after said receptacle-support has reached said predetermined position.

3. A filling machine comprising a filling nozzle which has an outlet, a by-pass pipe connected to said filling nozzle, a movable valve associated with said filling nozzle and adapted to control said outlet, a receptacle-support movable towards said outlet and away therefrom, actuating means adapted to actuate said receptacle-support towards said nozzle to a predetermined position in which a receptacle is supported on said receptacle-support with the mouth of the receptacle at the outlet of the nozzle, said actuating means being adapted to yieldingly urge said receptacle beyond said position, valve-operating mechanism adapted to move said valve to an open position, a movable control member, said actuating means being adapted to be connected to said valve-operating mechanism through said movable control member, said control member being movable to an operative position and also to an inoperative position, said actuating means being adapted first to actuate said receptacle support towards said nozzle and then to actuate said valve-operating means, control means movable in unison with said receptacle-support and adapted to move said control member to its inoperative position only after said receptacle-support has moved beyond said predetermined position.

4. Filling mechanism comprising a magazine which has a discharge end, a filling nozzle which has an inlet and an outlet, feed mechanism located between the discharge end of the magazine and the inlet of the nozzle and adapted to feed material from said magazine to the inlet of said nozzle, a valve which is movable relative to the inlet and the outlet of said nozzle, said valve being located at the outlet of said nozzle and being movable to open or to close the outlet of the nozzle, a valve casing in which said valve is located, said valve casing having an opening through which material can be discharged, a by-

pass pipe having an inlet end and an outlet end, the inlet end of said pipe being connected to said nozzle, the outlet end of said pipe being located in said magazine, said nozzle and said valve being shaped to admit material freely to said pipe when the valve is closed, said valve casing having a sealing gasket which has an opening which is in registration with said opening of the valve casing, a receptacle-support which is movable to a position in which a receptacle which is located on said support has the mouth of said receptacle in registration with the opening of the gasket and said mouth abuts said gasket, mechanism adapted to move said support to said position, said mechanism including a spring which is external to said nozzle, additional mechanism adapted to open said valve when a receptacle is in said position.

5. Filling mechanism comprising a filling nozzle having an inlet and an outlet, means adapted to supply material to said inlet, a valve which is movable relative to said inlet and said outlet, said valve being movable to open or to close said outlet, a by-pass pipe having one end thereof connected to said nozzle and having its other end located in a reservoir, said nozzle and said valve being shaped to admit material freely to said pipe when said valve closes said outlet, said nozzle having a sealing member associated therewith, said sealing member having an opening through which material can pass from said outlet, a receptacle support which is movable to a position in which a receptacle which is located on said support has the mouth of said receptacle in registration with the opening of said sealing member and said mouth abuts said sealing member, mechanism adapted to move said support to

said position, said mechanism including a spring which is external to said nozzle, additional mechanism adapted to open said valve when a receptacle is in said position.

6. Filling mechanism for filling receptacles, comprising a nozzle having an inlet and an outlet, a valve movable relative to said outlet and adapted to open and to close said outlet, biasing means biasing said valve to a normally closed position, valve-operating mechanism adapted to open said valve, said valve-operating mechanism including a control-member, a receptacle-support, actuating mechanism adapted to move said receptacle-support towards said outlet and away therefrom, said actuating mechanism including an arm which is adapted to abut and to actuate said control-member and to actuate said valve-operating mechanism when said control member is located in the path of movement of said arm, said control-member being movable relative to the adjacent member of said valve-operating mechanism in a direction away from the path of movement of said arm, said actuating mechanism including a member which is adapted to move said control-member out of said path only when a receptacle is not located on said receptacle-support, said actuating mechanism including a spring and being adapted to actuate said receptacle-support to a position in which the distance between said receptacle-support and said outlet is less than the height of the receptacle, said spring yielding when the distance between the receptacle-support and the outlet is less than the height of the receptacle.

HANS REICHLE. 35