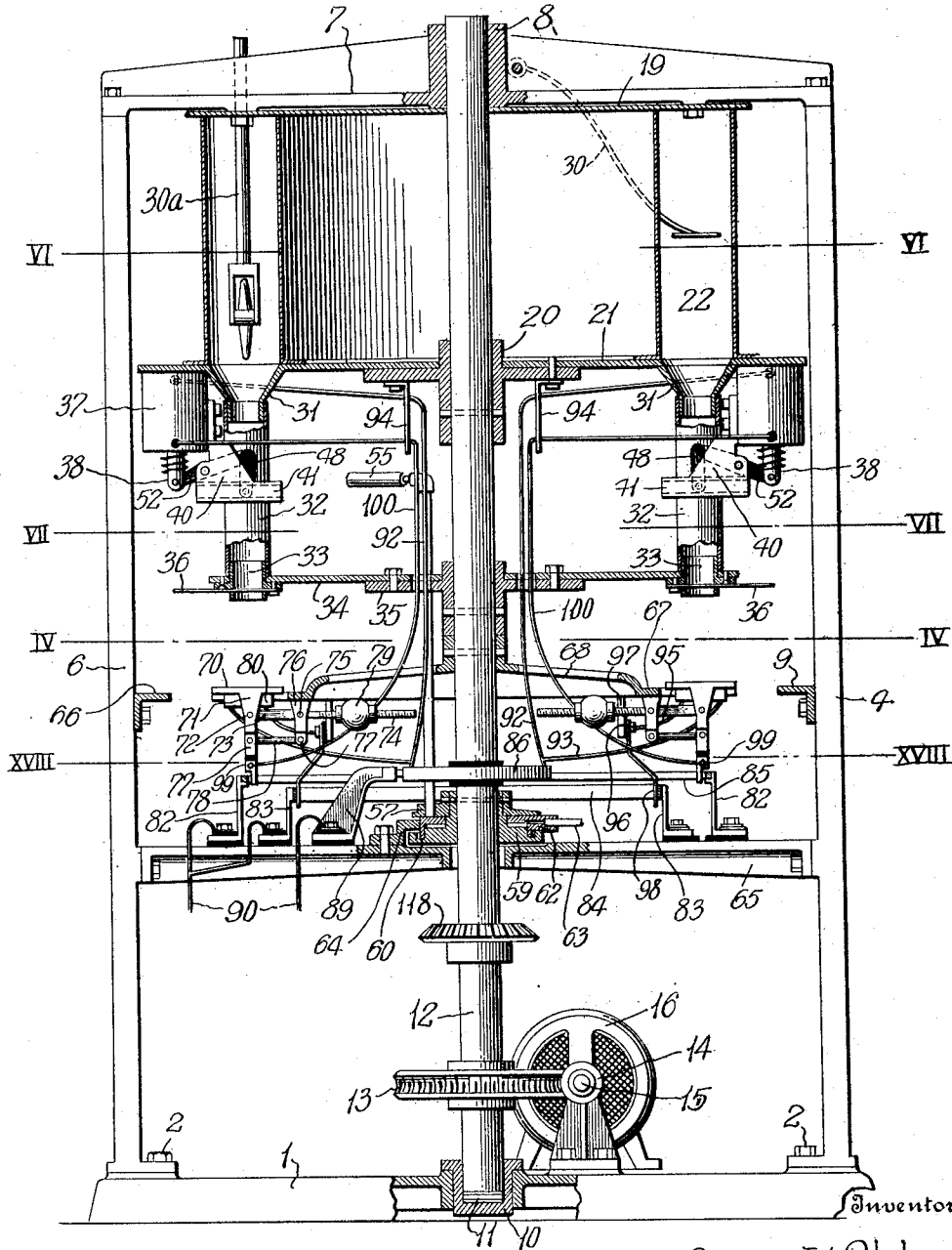


G. W. BLAKE.
CAN FILLING MACHINE.
APPLICATION FILED MAY 11, 1917.

1,278,097.

Patented Sept. 10, 1918.
6 SHEETS—SHEET 1.



Witness
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Fig. 1.

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Fig. 2.

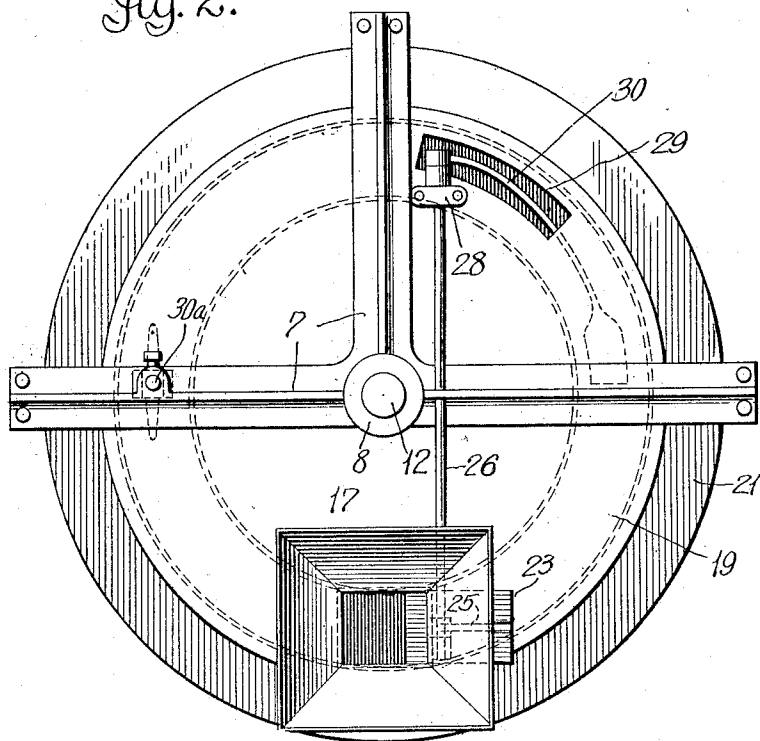
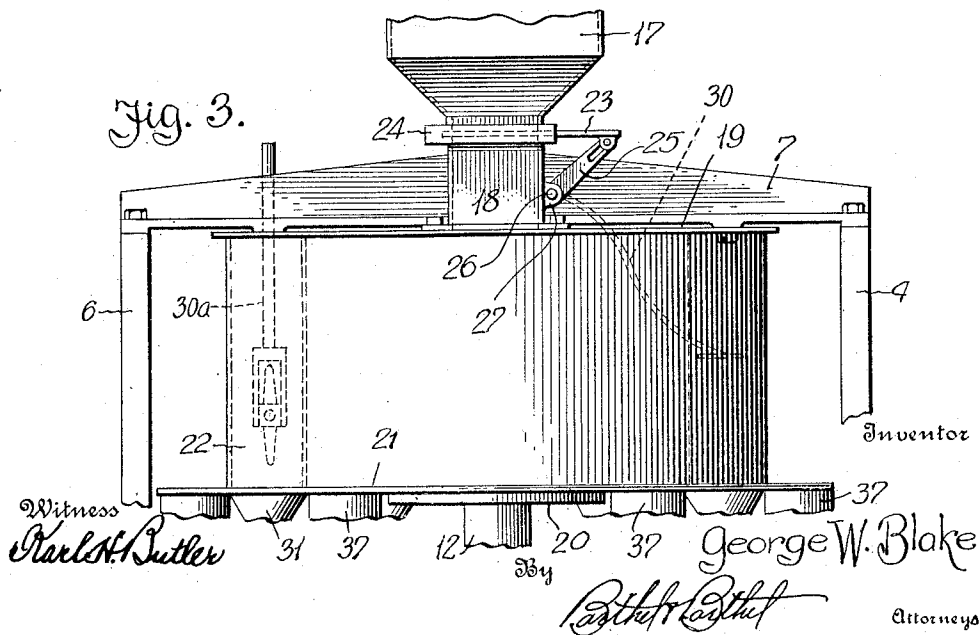


Fig. 3.



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Fig. 6.

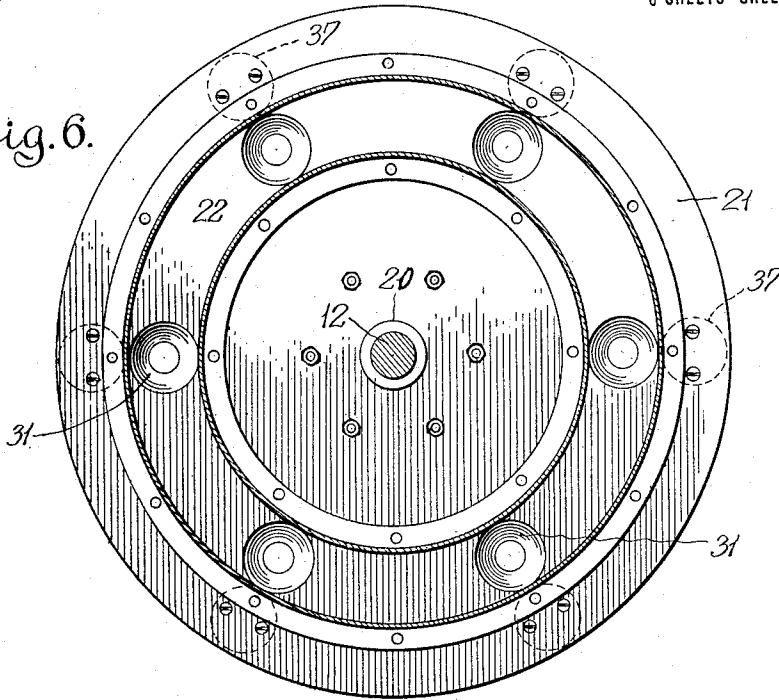
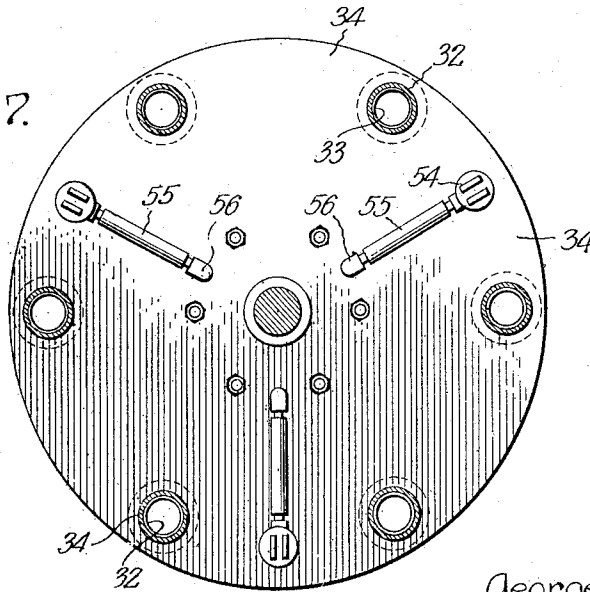


Fig. 7.



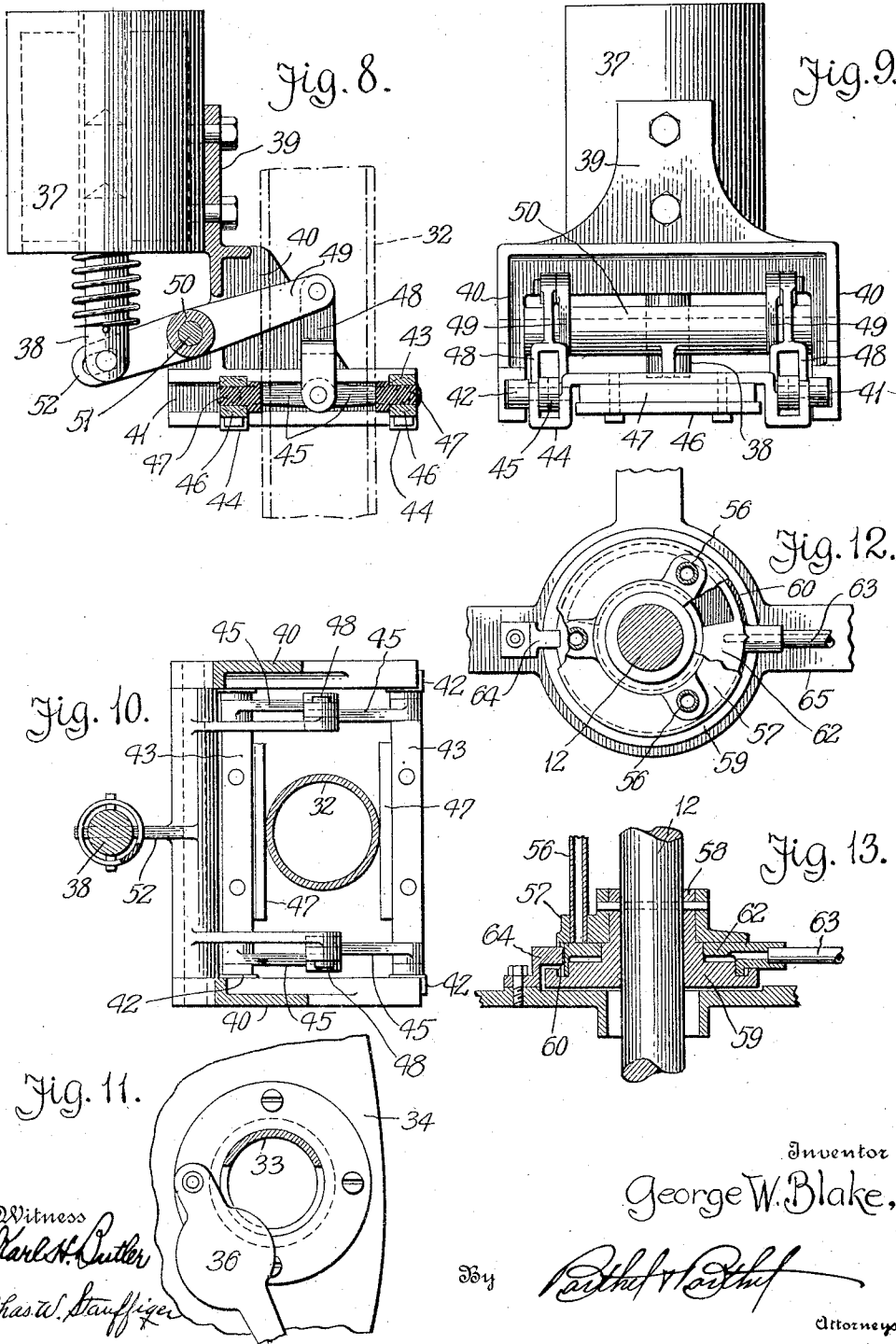
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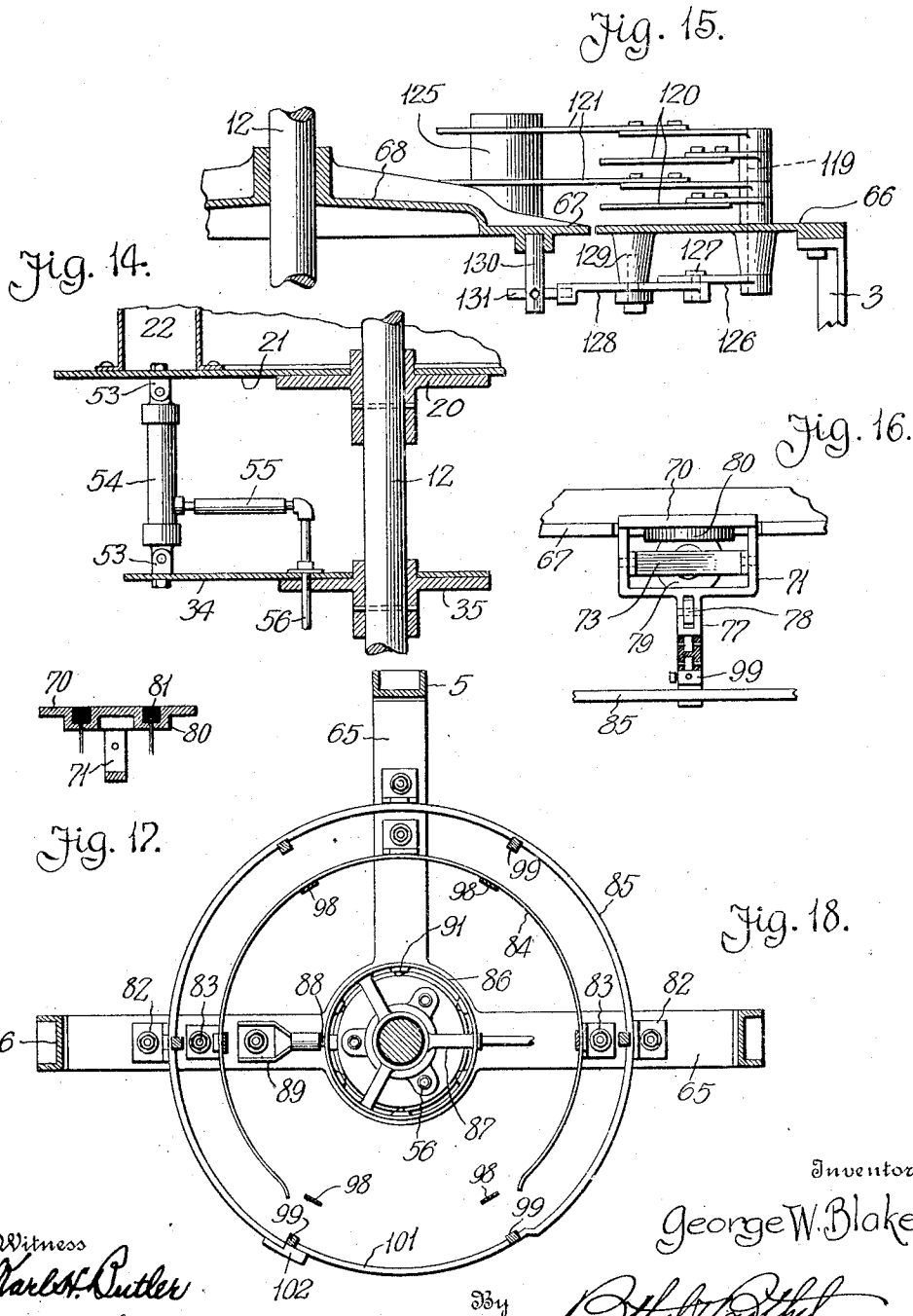
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Patented Sept. 10, 1918.
6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

GEORGE W. BLAKE, OF WYANDOTTE, MICHIGAN.

CAN-FILLING MACHINE.

1,278,097.

Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed May 11, 1917. Serial No. 167,878.

To all whom it may concern:

Be it known that I, GEORGE W. BLAKE, a citizen of the United States of America, residing at Wyandotte, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Can-Filling Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an automatic filling machine, and has special reference to a machine for filling cans, cartons, containers or receptacles with granular, pulverized or loose matter, for instance, sugar, salt, etc. The machine may also handle liquids, as molasses, and any free flowing fluid.

My invention aims to provide a rotary filling machine wherein positive and reliable means are employed, in a manner as hereinafter set forth, for automatically and successively filling receptacles placed in the machine with a predetermined quantity of matter that is automatically weighed with precision so that the receptacles are uniformly filled without shortage, overweight, or waste of matter poured in or out of the receptacle. The continuous and uninterrupted filling of receptacles in the machine necessitates means for supplying the machine with empty receptacles and the removal of filled receptacles, and this is accomplished by an automatic loading and unloading device for a rotary receptacle carrier of the machine.

My invention further aims to provide a rotary filling machine for various kinds of receptacles embodying a main reservoir and an auxiliary reservoir for matter that is to be placed in the receptacles. Provision is made for automatically controlling the supply of matter from the main reservoir to the auxiliary reservoir and novel electrically operated feed shut off devices control the discharge of matter from the auxiliary reservoir.

My invention still further aims to provide a filling machine of the above type including pneumatic vibrators for the auxiliary reservoir of the machine and filling spouts thereof, and these pneumatic vibrators, together with other novel instrumentalities all cooperate to insure safe, expeditious and economical filling of receptacles; the machine requiring no other attention than that of starting and stopping the same.

The principal parts of my machine,—namely, a main frame, power and driven

shafts; main and auxiliary feed reservoirs with automatic controlling devices between the reservoirs; electrically operated feed shut off devices for the auxiliary reservoir; pneumatic vibrators for the auxiliary reservoir and valve controlling the operation of the vibrators; rotary carrier and scale platforms; power distributor for the electrical devices of the machine; and an automatic loading and unloading device for the rotary carrier,—will be hereinafter separately and specifically described in detail together with the novel arrangement and objects accomplished from such a combination of parts.

Reference will now be had to the drawings, wherein—

Figure 1 is a vertical sectional view of the automatic filling machine, partly in elevation and partly broken away;

Fig. 2 is a plan of a portion of the machine showing the main and auxiliary reservoirs;

Fig. 3 is a side elevation of the upper portion of the machine, showing the automatic feed controlling device between the main and auxiliary reservoirs;

Fig. 4 is a horizontal sectional view of the machine, taken on the line IV—IV of Fig. 1;

Fig. 5 is an enlarged sectional view of an electrically operated feed shut off device of which there are a number in connection with the machine, this particular device being shown as actuated to restrict the passage through a feed spout of the machine;

Fig. 6 is a horizontal sectional view taken on the line VI—VI of Fig. 1;

Fig. 7 is a similar view taken on the line VII—VII of Fig. 1;

Fig. 8 is a longitudinal sectional view of one of the electrically operated feed shut off devices, showing the same in open position compared to the showing in Fig. 5;

Fig. 9 is a front elevation of the same;

Fig. 10 is a plan of the same;

Fig. 11 is a plan of a manually operated shutter or valve for each discharge spout of the machine;

Fig. 12 is a plan of an automatic air controlled valve for the pneumatic vibrators of the machine;

Fig. 13 is a vertical sectional view of the same;

Fig. 14 is a detail view of a portion of the machine showing one of the pneumatic vibrators thereof;

Fig. 15 is a side elevation of the automatic loading and unloading device of the machine;

Fig. 16 is an end view of a scale platform adapted to form part of a rotary carrier;

Fig. 17 is a detail sectional view of the scale platform showing a magnetic receptacle holder, and

Fig. 18 is a horizontal sectional view taken on the line XVIII—XVIII of Fig. 1, illustrating an electrical distributor for the various electrical devices of the machine.

In describing my invention by aid of the views above referred to, I desire to point out that the same are merely illustrative of the automatic receptacle filling machine as now being constructed by me, and I do not care to confine myself to the precise construction and arrangement of parts shown. The following description is therefore to be broadly construed as including such substitute constructions and arrangement of parts as are the obvious equivalent of those to be hereinafter referred to under separate captions.

Main frame, power and driven shafts.

(Figs. 1, 2 and 4.)

The reference numeral 1 denotes a suitable base or foundation and rigidly connected thereto, as at 2, are a plurality of uprights or columns 3, 4, 5 and 6, the uprights 4, 5 and 6 being of the same height and having the upper ends thereof connected by a three-arm spider 7 provided with a central vertical bearing 8. The upright 3 is of less height than the uprights 4, 5 and 6 and coöperates with the uprights 4 and 6 in supporting a horizontal platform 9 at what may be considered the front side of the machine, said platform constituting a support for the automatic loading and unloading device of the machine.

The base 1 is provided with a central socket 10 and an end thrust bearing 11 for a vertical drive shaft 12 which has the upper edge thereof journaled in the bearing 8 of the spider 7. Fixed on the drive shaft 12, above the base 1, is a worm wheel 13 engaging with a worm 14 on the armature shaft 15 of an electric motor 16, the motor being operated from a suitable source of electrical energy and constituting power of a convenient form for operating the filling machine.

Main and auxiliary reservoirs with automatic feed controlling device between the reservoirs.

(Figs. 1, 2, 3 and 6.)

Suitably supported above the machine is a main reservoir 17 for matter to be handled by the machine in filling receptacles and this main reservoir has a down pipe or discharge spout 18 connected to a circular cover plate

19 attached to the bottom side of the spider 7, said cover having an opening in communication with the discharge spout 18 of the main reservoir.

The drive shaft 12 is provided with a fixed collar 20 and suitably connected thereto is a circular bottom plate 21 for an annular auxiliary reservoir 22 composed of inner and outer annular walls, as best shown in Figs. 1 and 6. The annular reservoir 22 is rotatable with the drive shaft 12 and the upper edges of the reservoir are free to move beneath the cover 19, which excludes dust and foreign matter from the auxiliary reservoir. The auxiliary reservoir is constantly in communication with the discharge spout 18 of the main reservoir 17. To control the supply of matter to the auxiliary reservoir 22, the discharge spout 18 of the main reservoir 17 is provided with a gate 23 slidable in a guide member 24 carried by the discharge spout 18. The gate 23 is opened and closed by a slotted crank 25 articulated with the gate and carried by a rock shaft 26 journaled in bearings 27 and 28 on the spout 18 and the cover 19 respectively. As shown in Fig. 2, the main reservoir 17 is preferably located at the front side of the auxiliary reservoir 22, and the rock shaft 26 extends rearwardly across the cover 19 to a segment shaped slot 29 in said cover. On the end of the rock shaft 26 is fixed a curved drag or float arm 30 extending through the slot 29 into the auxiliary reservoir 22, to be raised and lowered by dragging over the surface of the matter deposited in the auxiliary reservoir from the main reservoir. The end of the arm 30 is flattened for this purpose and as the level of the matter within the auxiliary reservoir 22 is raised therein, the arm 30 is gradually raised to impart a rocking movement to the shaft 26 and gradually close the gate 23. In this matter the supply of material to the auxiliary reservoir 22 is automatically controlled, and to prevent the material or matter in the auxiliary reservoir from unduly caking, packing down or solidifying, the cover 19 is provided with a depending agitator 30^a, preferably in the form of a revoluble star wheel that is caused to revolve and agitate the matter within the auxiliary reservoir, when said reservoir is revolved by the drive shaft 12.

The bottom plate 21 of the auxiliary reservoir 22 is provided with a plurality of circumferentially disposed and equally spaced discharge nipples 31, preferably six in number for this particular size of machine. Suitably connected to the nipples 31 are depending flexible and tubular discharge spouts 32 having the lower ends thereof suitably connected to discharge nozzles 33, carried by a circular plate 34 mounted on a collar 35 attached to the drive shaft 12. The nozzles 33 are fitted with pivoted horizontal manu-

ally operated shutters 36 so that the discharge nozzles can be closed, particularly during a cessation in the operation of the machine. A detail of one of the nozzles and the shutter thereof is shown in Fig. 11.

Electrically operated feed shut-off devices for the auxiliary reservoir.

(Figs. 1, 5, 8, 9 and 10.)

10 On the lower face of the bottom plate 21 contiguous to each discharge nipple 31 of the auxiliary reservoir 22, is a solenoid 37 having a shiftable core 38. Attached to
15 that side of the solenoid confronting the discharge nipple 31 is a depending bracket 39 provided with side arms 40 having channel guides 41 at the lower edges thereof. The channel guides 41 serve functionally as rails
20 for rollers 42 on the ends of shut off members 43. Each shut-off member, as best shown in Fig. 9, has yoke portions 44 at the ends thereof for pivoted toggles 45, and connected to these members by clamping bars
25 46, are presser blocks 47, preferably made of yieldable material, as rubber. The shut-off members 43 are normally separated and permit of the flexible spout 32 extending therebetween, as shown in Fig. 10, and by causing
30 said shut-off members to move toward each other, as shown in Fig. 5, the walls of the flexible spout 32 may be pressed or collapsed to restrict the passage through the spout or eventually shut off the flow of material
35 therethrough.

The toggles 45 of the shut-off members 43 are pivotally connected together and to the lower ends of links 48 pivotally connected to cranks 49 on the end of a sleeve 50, loose
40 on a rod 51 connecting the side arms 40 of the bracket 39. The sleeve 50 intermediate the ends thereof, has a slotted crank 52 connected to the core 38 of the solenoid 37, so that when the solenoid 37 is energized the
45 toggles 45 will be broken downwardly, as shown in Fig. 5, thus drawing the shut-off members 43 toward each other to press or collapse walls of the flexible spout 32.

50 *Pneumatic vibrators for the auxiliary reservoirs and the valve controlling the operation of the vibrators.*

(Figs. 1, 7, 12, 13 and 14.)

55 The confronting faces of the plates 21 and 34 are connected by a plurality of pneumatic vibrators positioned between some of the spouts 32, said plates having the confronting faces thereof provided with apertured
60 lugs 53 connected by cylinders 54 and in said cylinders are air reciprocated plungers which when actuated are adapted to vibrate the plates 21 and 34 and parts carried thereby. The pneumatic vibrators 54 are
65 of a conventional form and are employed

to prevent the contents of the auxiliary reservoir 22 clogging the spouts 32 or becoming caked within the discharge nipples 31. The pneumatic vibrators are connected by hose or flexible connections 55 to air pipes 56, 70 and these pipes extend downwardly through the plates 34 to a valve head 57 fixed relative to the drive shaft 12. Extending into the valve head 57 and fixed on the drive shaft 12 is the hub portion 58 of a rotary
75 member 59, said member having an annular groove 60 to receive the depending flange of a stationary semi-circular air inlet member 62, connected to an air supply pipe 63. The semi-circular member 62 has a sliding fit
80 with the member 59 and air entering said member 62 holds the member against the head 57 to preclude leakage of air. The member 62 is held against rotation by a stop 64 mounted on a three-arm spider 65
85 connecting the uprights 4, 5 and 6. The member 62 may receive air under compression, from any suitable source and since such member is stationary relative to the rotary valve head 57, it is apparent that air will be
90 alternately admitted to one pipe 56 and then to another, and in this manner the pneumatic vibrators are intermittently actuated.

Rotary carrier and scale platform.

(Figs. 1, 4, 15, 16 and 17.)

The platform 9 connecting the uprights 3, 4 and 6 has a portion thereof, designated
100 66, in a plane slightly above the plane of the remaining portion of the platform and the inner edge of said platform conforms to the periphery of a rotary carrier 67 supported in a horizontal plane by a spider 68 from the drive shaft 12 of the machine. The
105 outer marginal edges of the carrier 67 are cut away, as at 69, to provide clearance for scale platforms 70 corresponding in number to the flexible spouts 32 of the machine. Each scale platform has a depending stirrup
110 71 pivotally connected as at 72, to a yoke 73 on the outer end of a scale beam 74.

The yoke 73 of the scale beam 74 is pivotally connected, as at 75, to a stirrup shaped hanger 76 of the carrier 67 and this
115 hanger, as well as the stirrup, 71, has depending lugs 77 pivotally connected to the ends of a link 78. The manner of articulating the scale platform 70 relative to the carrier 67 maintains the scale platform normally in a horizontal plane during a tilting
120 action of the beam 74 or adjustment of a poise or weight 79 on the beam.

Each scale platform has an annular depressed or counter-sunk portion 80 for a
125 magnetic receptacle holding device 81 in the form of a coil which when rendered operative for the purpose for which it is intended by the passing of an electric current therethrough will retain a metallic recep-
130

tacle or one having a metallic bottom on the scale platform. This receptacle holding device will prevent receptacles from laterally shifting or becoming accidentally displaced relative to the scale platform, particularly during the rotary movement of the carrier 67, and these electrical receptacle holding devices are only brought into action during a portion of a revolution of the rotary carrier 67.

Power distributor for the electrical devices of the machine.

(Figs. 1 and 18.)

On the arms of the spider 65 and insulated therefrom are brackets 82 and 83, the latter being set in relation to the former so that the brackets 83 may support a split distributing ring 84 concentric with a distributing ring 85 carried by the brackets 82.

On the drive shaft 12 and insulated therefrom is a distributing ring 86 supported concentric with the ring 84 and in spaced relation to the drive shaft 12 by a spider 87, said spider providing clearance for the air pipe 56 and electrical connections extending to the solenoids 37 of the machine. Engaging the distributing ring 86 is a brush 88 carried by a bracket 89 supported on and insulated from the arms of the spider 65. Connected to the bracket 89 and those brackets 82 and 83 contiguous to the bracket 89 are lead-in wires 90 from a suitable source of electrical energy, and the inner side of the distributing ring 86 has a plurality of binding posts 91 for wires 92 and 93. The wires 92 extend upwardly through the spider 68, collar 35, plate 34, and through hangers 94 carried by the collar 20, to the solenoids 37. The wires 93 extend under the scale mechanism to the magnetic devices 81 in the scale platform 70 and said devices have return wires 95 to binding posts 96 carried by and insulated from hangers 97 of the rotary carrier 67. The binding posts 96 are provided with depending resilient brushes or fingers 98 in contact with and adapted to wipe the inner side of the distributing ring 84. The gap in the distributing ring 84 breaks the electrical circuit in the magnetic devices 81 of the scale platform 70 during the interim of loading and unloading said platform.

The depending lugs 77 of the scale platform stirrups 71 are provided with insulated contact members 99, one of which is best shown in Fig. 16. These contact members are connected by wires 100 to the solenoids 37, said wires following the wire 92, as shown in Fig. 1. The contact members 99 are placed in wiping contact with the distributing ring 85 when the scale platforms 70 are depressed for the filling of receptacles, and the distributing ring 85 has an inset portion 101 engaged by the contact members 99

after the scale platform assumes normal position. Briefly, the contact members 99 being pressed into engagement with the ring 85, establish electrical circuits through the solenoids 35 energizing said solenoids, and thus operating the shut-off devices. In this manner a predetermined quantity of material can be placed in a receptacle on the scale platform, but when the receptacle is removed to be replaced by an empty receptacle, it is necessary that the circuit be maintained through the electrical shut-off device until an empty receptacle is in position. This is accomplished by the inset portion 101 of the distributing ring 85, and as there is liable to be an arc at one end of the inset portion 101 of the ring 85, when the contact members 99 travel out of engagement therewith, an insert 102 of carbon or of material of greater resistance than the ring 85, is interposed at what may be considered the inner end of the inset portion 101, as the rotary carrier 67 revolves in a clockwise direction.

Automatic loading and unloading device for the rotary carrier.

(Figs. 1, 4 and 15.)

The lower portion of the platform 9 is provided with substantially a radially disposed unloading extension 103 and on this extension are adjustable guides 104 for guiding receptacles off of the platform. The raised portion 66 of the platform 9 has a tangentially disposed extension 105 provided with adjustable guides 106 extending into the raised portion of the platform. Between the guides 106 and countersunk relative to the platform is a strand of an endless conveyer 107, said endless conveyer extending through an opening 108 in the platform and about a drum or pulley 109 mounted on a shaft 110, journaled in hangers 111, carried by the bottom side of the platform 9. The outer end of the shaft 110 has a wheel 112 over which is trained a belt or chain 113, said belt or chain extending under a wheel 114 on a radially disposed shaft 115. The radially disposed shaft 115 is journaled in suitable bearings 116 on the base 1 of the machine and the inner end of said shaft has a beveled gear wheel 117 meshing with a horizontally disposed beveled gear wheel 118 on the drive shaft 12 of the machine. The power transmission from the drive shaft 12 is such that the endless conveyer 107 will be operated at a speed consistent with the rotation of the carrier 67, so that the empty receptacles will be constantly in position to be shifted on to the scale platforms 70 of the rotary carrier.

Rotatable in the raised portion 66 of the platform 9 is a vertically disposed shaft 119 and fixed on the upper end of said shaft are sets of extensible loading arms 120 and un-

loading arms 121. The set of loading arms 120 is adapted to swing in a lateral plane over an adjustable stop 122 on the platform 9 and engage an empty receptacle 123 on the conveyer 107 and shift the receptacle on to the scale platform 70 in proximity to said conveyer. The loading arms 120 have curved extensions 124 to engage an empty receptacle following that one shifted by said arm, thus temporarily holding the following receptacle so that it cannot be shifted behind the loading arms and swept from the machine.

The unloading arms 121 have the outer ends thereof slightly curved so as to readily engage a loaded or filled receptacle 125 on the scale platform 70 in the plane of the platform extension 103.

To rock the vertical shaft 119 so that the arms 120 and 121 may simultaneously load and unload the rotary carrier 67, the lower end of the shaft 119 has a slotted crank 126, and engaging in the slot of said crank is a pin 127 carried by one end of a lever 128 pivoted on the lower end of a bearing 129, carried by the platform 9. The lever 128 extends under the rotary carrier 67 and said carrier has a hanger 130 for an adjustable detent 131, which is adapted to impinge against the lever 128. Six times during each complete rotation of the carrier 67, the loading and unloading arms 120 and 121 are actuated, and to hold said arms in position for such actuation, there is an adjustable stop 132 on the raised portion 66 of the platform 9, said stop being engaged by the set of loading arms 120, which are held normally in engagement with the stop by the retractile force of the spring 133, below the platform and connecting the crank 126 to one of the bearings 111 of the conveyer shaft 110.

General operation.

Although I do not show it, it is apparent that the supply of air, under compression and motive power to the machine may be simultaneously controlled, nevertheless, I will assume that the motor 16 has been started, that the distributing rings 84, 85 and 86 are in circuit with a suitable source of electrical energy, and that there is a supply of air, under pressure, for the air valve controlling the operation of the pneumatic vibrators.

As set forth in the beginning, the machine has been designed for filling various kinds of receptacles and as long as small quantities of matter are to be placed in receptacles it is preferable to use metallic receptacles, as cans or containers having metallic bottoms. This is essential in order that the magnetic devices may be utilized for temporarily holding the small receptacles on the scale platform, otherwise the magnetic devices may be dis-

pensed with in connection with large receptacles, as the contents thereof will be of sufficient weight to prevent accidental displacement of the receptacles during the movement of the rotary carrier.

Assuming that the loaded or filled receptacle 125 has been removed from its scale platform 70, the platform is immediately elevated, taking the top of the contact member 99 out of engagement with the distributing ring 85, but maintaining the side of the contact member 99 in engagement with the inset portion 101 of said distributing ring. In this manner, the circuit in the solenoid above the empty scale platform is maintained closed, consequently matter cannot be discharged from the spout 32 above the empty scale platform, during its movement from an unloading position to a loading position.

Immediately upon an empty scale platform reaching a loading position, the set of loading arms 120 shift the empty receptacle 123 on to the empty scale platform and this is easily accomplished as the raised portion 66 of the platform 9 is in the same plane as the elevated scale platform. As the rotary carrier 67 is revolved, the side of the contact member 99 rides out of engagement with the inset portion 101 of the distributing ring 85, but the top of the contact member 99 is not brought into engagement with the distributing ring 85, as the weight of the empty receptacle is not sufficient to lower the scale platform to that extent. Consequently the circuit in the solenoid above the empty receptacle is broken when the contact member 99 rides out of engagement with the inset portion 101 of the distributing ring 85. So, matter from the auxiliary reservoir 22 may flow by gravity through the flexible spout 32 and enter the empty receptacle as it is moved by the rotary carrier 67. During its movement, the weight of the receptacle increases and irrespective of its location during the cycle of the carrier 67, the moment it overbalances the poise or weight 79 of the scale beam 74 which has been previously set for a predetermined quantity in the receptacle, the contact 99 engages the distributing ring 84 and remains in contact therewith until the filled receptacle is ejected from the rotary carrier 67. Of course during this time other receptacles are being filled. The capacity of the machine entirely depends upon the size of the rotary carrier and the loading and unloading devices serving the same.

What I claim is:—

1 In a filling machine, an annular reservoir, discharge spouts depending from the bottom of said reservoir, means for holding receptacles below said spouts to receive predetermined quantities of matter from said reservoir, an electrical device adjacent said

spout adapted to close said spout by compressing the walls thereof when the receptacle below said spout receives a predetermined quantity.

5 2. In a filling machine, a reservoir, a discharge spout therefor, means for holding a receptacle below said spout to receive a predetermined quantity of matter from said reservoir, and an electrical device adapted to
10 close said spout when the receptacle receives a predetermined quantity of matter, said electrical device including a vertically disposed solenoid, laterally opposed slidable shut off members, and toggles connected to
15 said members and actuated by the core of said solenoid to cause said members to compress walls of said spout.

3. In a filling machine, a reservoir, flexible discharge spouts carried thereby, a rotary
20 receptacle carrier adapted to hold receptacles to be filled from said reservoir, means adapted for loading and unloading said carrier, a source of electrical energy, electrical devices in a normally open circuit with said
25 source of electrical energy and adapted to close said spouts, and means as part of said carrier adapted to close the circuits of an electrical device in the interim of loading and unloading said carrier.

30 4. In a filling machine, a reservoir, collapsible discharge spouts therefor, scales adapted to hold receptacles under said spouts adapted to receive a predetermined quantity of matter from said spouts, electrical devices adapted for an open circuit
35 with a source of electrical energy and adapted to collapse said spouts, and means in connection with said scales adapted to successively close the circuits of said electrical
40 devices to successively collapse said spouts.

5. In a filling machine, a reservoir, discharge spouts therefor, scales adapted to hold receptacles under said spouts to receive a predetermined quantity of matter
45 from said spouts, electrical devices adapted for holding receptacles on said scales, electrical devices adapted for an open circuit with said source of electrical energy and adapted to close said spouts, oscillator means
50 actuated by said carrier adapted for simultaneously loading and unloading said scales, and means in connection with said scales adapted to close the circuits of said electrical devices during the interim of loading
55 and unloading said scales and at such times that a receptacle receives a predetermined quantity of matter from said reservoir.

6. In a filling machine, a reservoir, discharge spouts therefor, electrically operated shut-off devices for said spouts, a carrier
60 adapted to hold said receptacles below said spouts to be filled, and means on said magnetic carrier adapted to retain receptacles
65 thereon.

7. In a filling machine, the combination of a rotary vertical shaft, an annular reservoir about said shaft and in spaced relation thereto, spouts depending from the bottom of said reservoir, a receptacle carrier
70 on said shaft below said spouts, electrically operated means adapted to control the discharge from said spouts, and means below said carrier adapted to govern the operation of said electrical means. 75

8. In a filling machine, a reservoir, discharge spouts therefor, electrically operated shut-off devices for said spouts, a carrier adapted to hold receptacles beneath said
80 spouts to be filled, a current distributing ring below said carrier, means movable with said carrier and adapted to be lowered to engage said ring and control the operation of said electrically operated shut-off devices, and means actuated by said carrier
85 adapted for loading and unloading said carrier.

9. In a filling machine, a rotary carrier, weighing means on said carrier, a stationary main reservoir, an auxiliary reservoir movable with said rotary carrier supplied by
90 said main reservoir and adapted to fill receptacles on the weighing means of said carrier, means actuated by the contents of said movable reservoir, controlling the supply thereto from said main reservoir, and means automatically actuated by a predetermined weight of a receptacle and the contents thereof to control the supply from said
95 auxiliary reservoir. 100

10. In a filling machine, a stationary main reservoir, a rotary auxiliary reservoir adapted to be supplied from said stationary main reservoir, and means dragging on the contents of said rotary auxiliary reservoir
105 controlling the supply thereto from said stationary main reservoir.

11. In a filling machine, a rotary receptacle carrier, oscillatory means actuated by said carrier adapted for simultaneously loading
110 and unloading said carrier, a reservoir adapted for filling receptacles on said carrier, and electrical means movable with said carrier adapted for maintaining receptacles on said carrier during the filling of
115 said receptacles.

12. In a filling machine, a rotary receptacle carrier, means adapted for loading and unloading said carrier, a reservoir adapted for filling receptacles on said carrier, pneumatic means adapted to vibrate
120 said reservoir, means for weighing the receptacles and contents thereof, and electrical means movable with said carrier and adapted for controlling the filling of said
125 receptacles.

13. In a receptacle filling machine, a driven shaft, a circular auxiliary reservoir carried thereby, flexible discharge spouts for
130 said auxiliary reservoir, electrical devices

in circuit with said source of electrical energy and adapted to close said spouts by compressing the walls thereof, a carrier on said shaft, scales as a part of said carrier adapted to hold said receptacles below said spouts to receive a predetermined quantity of matter from said auxiliary reservoir, and means in connection with said scales adapted to close circuits of said electrical devices during the interim of loading and unloading of a scale and at such times as a receptacle receives a predetermined quantity of matter from said auxiliary reservoir.

14. In a receptacle filling machine, a driven shaft, an auxiliary reservoir carried thereby, a stationary main reservoir adapted to supply said auxiliary reservoir, means actuated by the contents of said auxiliary reservoir controlling the supply thereto, flexible discharge spouts for said auxiliary reservoir, electrical devices in circuit with said source of electrical energy and adapted to close said spouts by compressing the walls thereof, a carrier on said shaft, scales as part of said carrier adapted to hold receptacles below said spout to receive a predetermined quantity of matter from said auxiliary reservoir, and means in connection with said scales adapted to close the circuits of said electrical devices during the interim of loading and unloading scales and at such times as a receptacle receives a predetermined quantity of matter from said auxiliary reservoir.

15. A receptacle filling machine, a driven shaft, a circular auxiliary reservoir carried thereby, a stationary main reservoir adapted to supply said auxiliary reservoir, means actuated by the contents of said auxiliary reservoir for controlling the supply thereto, flexible discharge spouts for said auxiliary reservoir, electrical devices in circuit with a source of electrical energy to close said spouts by compressing the walls thereof, a carrier on said shaft, scales as part of said carrier adapted to hold receptacles below said spouts to receive a predetermined quantity of matter from said auxiliary reservoir, loading and unloading arms actuated by said carrier adapted to remove the receptacles from the platform and place the receptacles thereon, and means in connection with said scales adapted to close the circuits of said electrical devices during the interim of loading and unloading the scale and at such times as a receptacle receives a predetermined quantity of matter from said auxiliary reservoir.

16. A receptacle filling machine, a driven shaft, a circular auxiliary reservoir carried thereby, a stationary main reservoir adapted to supply said auxiliary reservoir, means actuated by the contents of said auxiliary reservoir for controlling the supply thereto, flexible discharge spouts for said

auxiliary reservoir, electrical devices in circuit with a source of electrical energy to close said spouts by compressing the walls thereof, a carrier on said shaft, scales as part of said carrier adapted to hold receptacles below said spouts to receive a predetermined quantity of matter from said auxiliary reservoir, loading and unloading arms actuated by said carrier adapted to remove the receptacles from the platform and place the receptacles thereon, means in connection with said scales adapted to close the circuits of said electrical devices during the interim of loading and unloading the scale and at such times as a receptacle receives a predetermined quantity of matter from said auxiliary reservoir, and intermittently actuated pneumatic vibrators for said auxiliary reservoir and said spouts controlled by the rotation of said driven shaft.

17. In a machine for placing matter in receptacles in which the matter is weighed and electrical devices automatically controlling the supply of matter to said receptacles, the combination of a rotary receptacle carrier having scale platforms as a part of said carrier adapted for supporting the receptacles, electric means below said carrier adapted to provide a closed circuit for said devices when the platforms are fully depressed, and means adapted to maintain said circuit closed during a partial rotation of said carrier, and during the substitution of an empty receptacle for a filled one.

18. In a machine for placing matter in receptacles and wherein electrical means is associated with scales for automatically controlling the supply of matter to the receptacles, the combination of a rotary carrier having scales as a part thereof, a distributing ring below said carrier, means movable to and from said distributing ring and forming part of said scales adapted for closing a circuit for said electrical means when a receptacle is being filled on said scales, and means as a part of said distributing ring adapted to maintain the circuit closed when a filled receptacle is removed from said scales.

19. In a machine for placing matter in receptacles, the combination of a rotary carrier adapted to support the receptacles to be filled, a loading and unloading platform for said carrier, and oscillatory means on said loading and unloading platform actuated by said rotary carrier adapted to simultaneously place an empty receptacle on said carrier and remove a filled receptacle therefrom.

20. In a filling machine, the combination of a rotary carrier adapted for holding receptacles to be filled, a loading and unloading platform for said carrier, loading arms on said platform adapted for shifting empty receptacles on to the said carrier and holding

other empty receptacles in reserve, unloading arms on said platform adapted for removing filled receptacles from said carrier, and means actuated by said carrier to simultaneously move said arms.

21. In a filling machine, the combination of a rotary receptacle carrier, loading and unloading means for simultaneously placing an empty receptacle on said carrier and removing a filled receptacle therefrom, and a plurality of electromechanical devices con-

trolling the filling of receptacles on said rotary carrier with some of said devices rendered inactive during the loading and unloading of said rotary receptacle carrier. 15

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE W. BLAKE.

Witnesses:

KARL H. BUTLER,
ANNA M. DORR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."