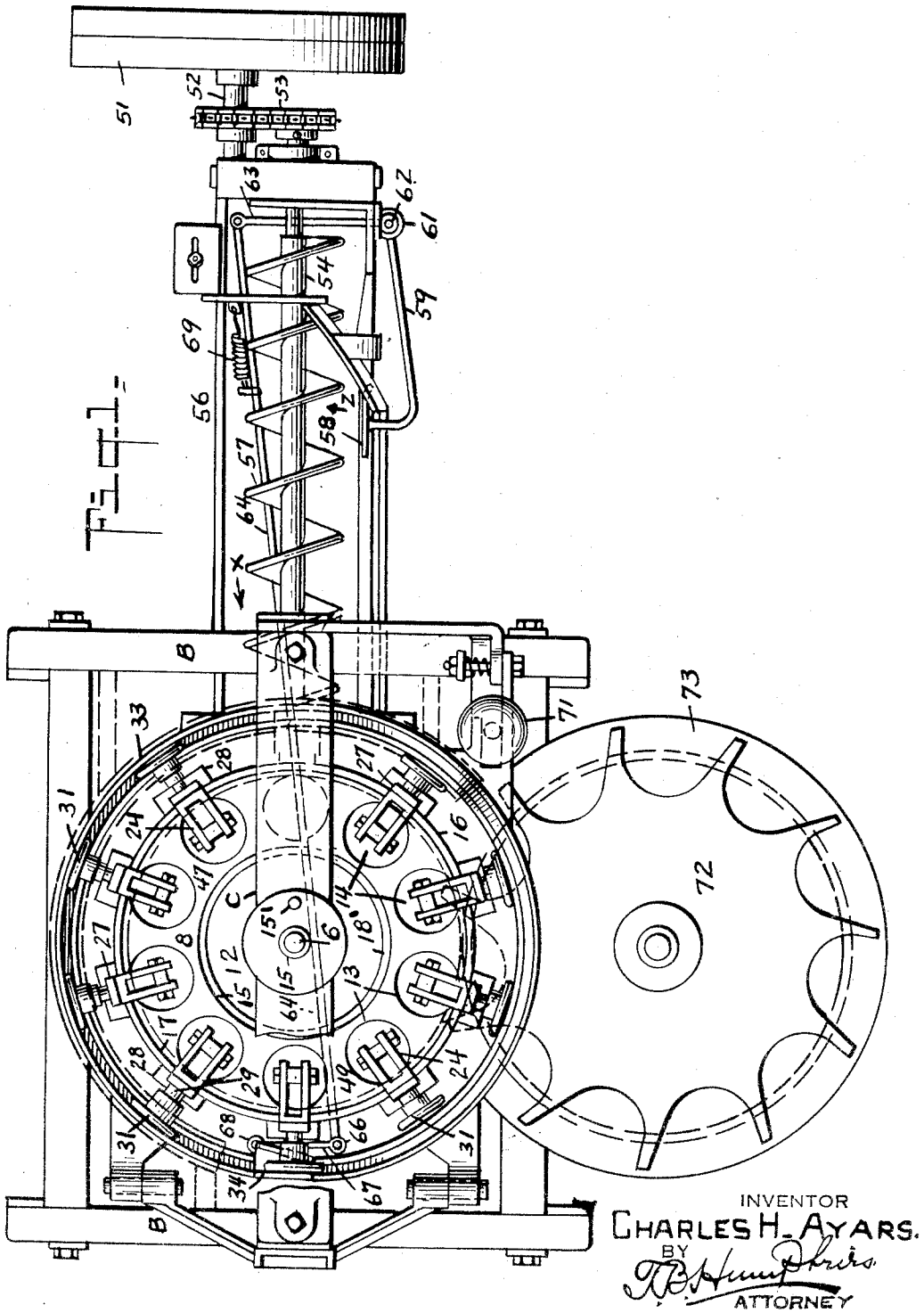
Jan. 16, 1940. C. H. AYARS 2,187,615

CAN FILLING MACHINE

Filed Aug. 1, 1938 2 Sheets-Sheet 1



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Fig. 2.

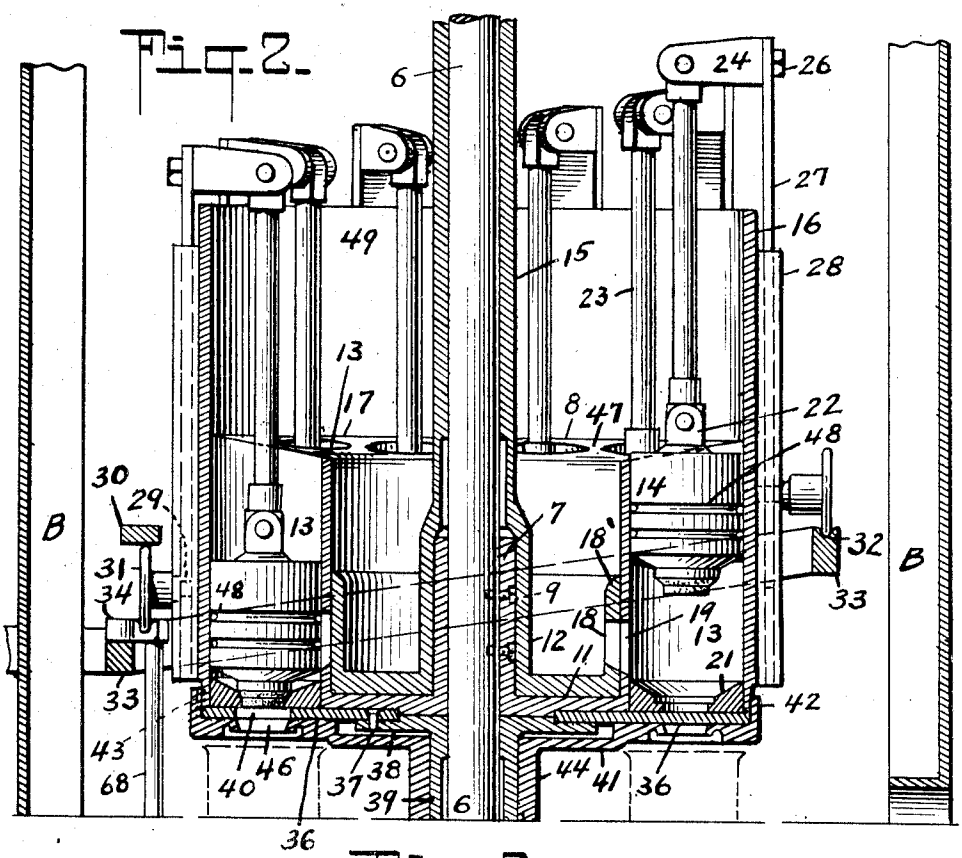
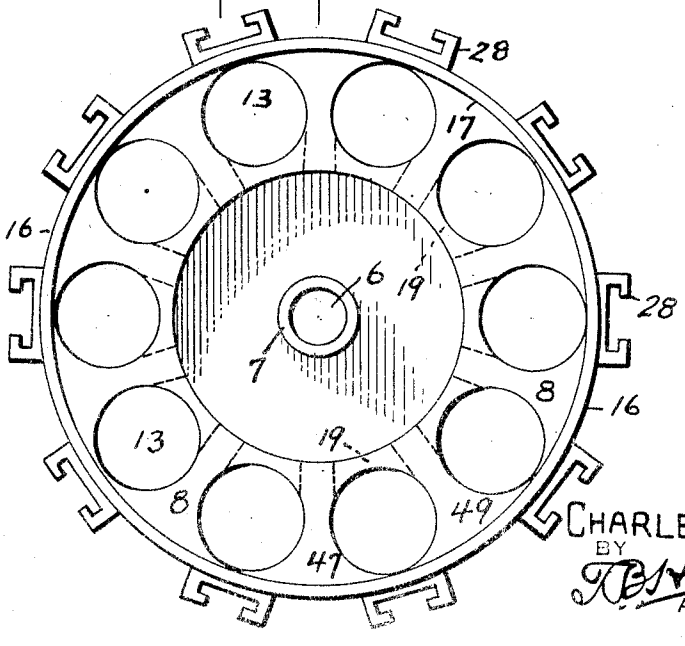


Fig. 3.



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2,187,615

CAN FILLING MACHINE

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Application August 1, 1938, Serial No. 222,425

25 Claims. (Cl. 226—96)

This invention relates to can filling machinery, and has particular reference to a machine which fills cans with predetermined quantities of liquid, viscous or semi-plastic materials in continuous succession.

The machine is particularly adapted for filling cans with liquid, such as oils, tomato juice, greases, etc., as well as semi-plastic materials, such for instance, as dog food and the like.

The object of the invention is to provide a can filling machine in which materials of accurate predetermined quantity are withdrawn from a supply by suction and forced into cans which are fed in continuous succession to the machine.

A further object of the invention is to provide a machine in which cans of different sizes may be accurately filled by simple adjustments on the machine.

Another object of the invention is to provide means to prevent any spilling of the material even though the same should seep past the plungers which withdraw the material from the supply and force the same into the cans.

Still another object of this invention is to provide a machine in which a sealing plate providing for the discharge of material from the pockets and the sealing of the bottoms of such pockets during the period in which they are taking their charge, is entirely enclosed, so as to obscure the same from view.

This invention is a continuation in part of the apparatus shown and described in my co-pending application Serial No. 188,825, filed February 5, 1938.

According to the invention, the can filling machine comprises a frame, a central rotatable shaft, a rotating hopper communicating with a stationary magazine or supply chamber, a discharge port in said supply chamber, a turret having a plurality of cylinders or pockets arranged for rotation around said chamber in unison with said hopper, an admission port in each of said pockets horizontally aligned with the discharge port in said chamber, a discharge port in the bottom of each pocket, a sealing plate having a discharge opening removed from the discharge port in said chamber and adapted to seal the discharge port in each pocket during the communication of the admission port of said pocket with the discharge port of said chamber, a plunger in each pocket, a track, a roller operably connected with each of said plungers, said track arranged in elevation to reciprocate the rollers engaged therewith, and to elevate said plungers during the communication between the pocket admission port and chamber discharge port, and lower said plungers during communication with the discharge port of said pocket and the discharge opening of said sealing plate, whereby the contents drawn into said pocket by the upward movement of said plunger are deposited into a can by the downward movement thereof.

The machine is also provided with means for bodily raising or lowering the supply chamber and turret mechanism, so as to provide the proper amount of space between the can table and mechanism for cans of different sizes, all of which mechanism is shown in my co-pending application above set forth.

The machine also has its hopper extended a considerable distance above the top of the turret and the bottom of said hopper rests within an annular flange of a turret plate which rotates with said hopper and which completely encloses the sealing plate.

The drawings illustrate an embodiment of the invention, and the views therein are as follows:

Figure 1 is a top plan view of the machine embodying my invention,

Figure 2 is a vertical sectional view of the intermediary part of my machine showing the particular features wherein the machine of this application differs from the machine shown and described in my co-pending application above set forth, and

Figure 3 is a top plan view of the combined hopper and turret.

The shaft 6 is driven from any suitable source of power and the upstanding bushing 7 of the turret 8 is provided with set screws 9 which extend into a keyway in said shaft, so that the combined turret and hopper rotates with said shaft. Immediately without the bushing 7 and concentric therewith is a cup 11 into which is fitted a magazine or supply chamber 12, while concentrically located around said magazine are pockets or cylinders 13 having plungers 14 operating therein. The outer concentric wall 16 of the hopper or combined turret and hopper extends a considerable distance above the top 17 of the turret, the purpose of which is later explained. The magazine has an upwardly extending sleeve 15 fitting around the shaft 6 and which is secured to the arch C of the frame B by a pin 15', so as to hold said magazine stationary. The magazine has a horizontally elongated discharge port 18 in its upstanding outer wall 18', while each of the cylinders or pockets 13 has a port 19

which is horizontally aligned with the port 18 of said magazine.

The bottoms of the cylinders or pockets 13 may be opened, or may be provided with a restriction member 21, as desired. Different types of restriction members are shown and described in my co-pending application. Each of the plungers 14 is provided with upwardly extending lips 22 between which is received one end of a connecting rod 23, while the upper end of said connecting rod is received into a bracket 24 secured by the bolts 26 to the reciprocating cross head 27. The cross head for each plunger consists of a bar reciprocally mounted in slotted guides 28 (see Figure 3) on the outside of the concentric wall 16. Each of said cross heads is provided with a bearing spindle 29 upon which a flanged roller 31 is rotatably and slidably mounted, that is to say, the roller is freely rotatable and is also freely movable longitudinally of the spindle 29, so that the flange of the roller 31 may be moved out of the groove 32 of the track 33 by means of the switch 34 when there is no can to be filled from the cylinder or pocket controlled by the particular roller which is disengaged from the track. This will be later described. The track is fastened to the frame B as shown and described in my co-pending application and the downwardly extending part thereof has a cooperating rail 30 for raising the pressure of the rollers when the same are descending.

The outer wall 16 may be made separate from the turret and connected therewith.

Below the bottom of the turret 8 is a sealing plate 36 which is secured by pins 37 to the flange 38 of a sleeve 39. This sleeve as shown in my co-pending application is held against rotation, so that the entire turret and hopper rotates on the sealing plate 36. This sealing plate has an elongated discharge opening 40 through which the material taken into said pockets is forced into the can A. Extending under the sealing plate 36 which has a circular periphery is a turret plate 41. This turret plate has an upstanding annular flange 42 which embraces the lower end of the outer concentric wall 16 forming the hopper, and a key 43 may insure the rotation of said turret plate with said hopper. This turret plate has a downwardly extending bushing 44 which fits around the stationary bushing 39, and rotates thereon. The turret plate 41 is provided with discharge openings 46 which are centrally aligned with the openings in the bottoms of the cylinders or the restrictive members 21. The turret has its upper face 47 sloping downwardly toward the shaft 6.

Each of the pistons or plungers 14 is provided with one or more grooves 48 which in operation will be filled with the material being handled, but it has been found that with some types of material, the juices therefrom will escape to the upper side of said plungers and when the outer wall 16 is of the same height as the turret 8, material may be spilled over the sides thereof, all of which causes waste and a messy condition of the machine. In this case, instead of having the hopper which feeds directly into the magazine or supply chamber 12, the material is placed into the space 49 defined by the outer wall 16 of the hopper, and the upper sloping face 47 of the turret enables any liquid material pulled to the top of the pockets 13 by the plungers to run down over the face of said turret, and into the space above the magazine 12.

Referring now to Figure 1, a drive pulley 51 is shown for driving the central shaft 6, and the shaft 52 on which said pulley is located, has a sprocket and chain connection 53 with the shaft 54 of the can feeding mechanism 56. This mechanism has a worm 57 which advances the cans to be filled, and each of the cans passing the trigger 58 pushes the same outward into the position shown in Figure 1, and as this trigger is connected to the arm 59 of a bell crank whose sleeve 61 is pivotally mounted on the pin 62, its operation will move the other arm 63 of said bell crank, so as to push the rod 64 in the direction shown by the arrow X. The other end of this rod 64 is pivoted at 66 to a lever 67 which has the sleeve 68 mounted on its other end and onto this sleeve the switch 34 is fixedly mounted, so that when the can strikes against the trigger 58 and the rod 64 moves in the direction of the arrow X, tension will be placed on the spring 69, and when the can leaves the trigger 58 and the roller 31 leaves the switch 34, the spring 69 will move the rod 64 in a direction contrary to the direction of the arrow X, thereby pulling the switch inward from the track 33 and moving the trigger in the direction of the arrow Z, where it will be in position to be engaged by the succeeding can passing through the feed mechanism 56, while, if said can is absent, the switch 34 will switch the flange 31 of the roller from the track and the particular cylinder whose roller is so switched is the cylinder whose contents were to be emptied into a can occupying the position of the missing can, so that when the can is missing, its cylinder will not take a charge of material, as its plunger will not be moved upward due to its roller being disengaged from the track. This mechanism has been described in my co-pending application hereinbefore mentioned as well as the hand wheel 71, which is operated to change the maximum height of the track 33 to cause the plungers to take a greater or less amount into their respective pockets, while the star wheel 72 operating over the table 73 removes the filled cans from under the turret.

The sealing plate 36 is constructed in exactly the same manner as the sealing plate shown in Figure 4 of the co-pending application, so that it is removable from the shaft 6. Upon the raising, the turret and hopper appear above the flange 42, so that said sealing plate can be taken from the machine for cleansing or repair through the space between the upper end of the annular flange 42 and the bottom of the outer wall 16 of the turret.

Of course, the filling machine illustrated and described herein may be modified in various ways without departing from the invention herein set forth and hereafter claimed.

The invention is hereby claimed as follows:

1. In a can filling machine, a hopper comprising a rotating part and a stationary cup part, measuring cylinders arranged concentrically within the rotating part of said hopper, a plunger in each cylinder, and means arranged to permit the plungers to successively draw charges from said cup part, the upper ends of said cylinders communicating with the rotating part of said hopper.

2. A can filling machine having a supply hopper, a rotary turret having measuring cylinders located within said hopper, said hopper having a stationary cup part surrounded by said cylinders, a plunger operating in each of said cylinders, each cylinder having a port in its side wall

for drawing material from said cup part into same on the upward stroke of the piston, the tops of said cylinders terminating a considerable distance below the top of said hopper whereby any material working past said plungers is returned to said hopper.

3. A can filling machine having a supply hopper, a turret having measuring cylinders having the upper ends opening into said hopper, a plunger in each cylinder, means for admitting material to said cylinders upon the upward stroke of said plungers, a discharge port below the cylinders for depositing the contents of the cylinders into cans, while any material working past said plungers is returned to the hopper.

4. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, and a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof.

5. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof, and means for concealing said stationary plate.

6. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, said hopper extending a considerable distance above the top of said turret, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, and a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof.

7. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, said hopper extending a considerable distance above the top of said turret, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof, and means for concealing said stationary plate.

8. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, the upper face of said turret sloping downwardly toward the center thereof, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, and a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof.

9. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, the upper face of said turret sloping downwardly toward the center thereof, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof, and means for concealing said stationary plate.

10. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, said hopper extending a considerable distance above the top of said turret, the upper face of said turret sloping downwardly toward the center thereof, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, and a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof.

11. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, a plunger in each cylinder, said hopper extending a considerable distance above the top of said turret, the upper face of said turret sloping downwardly toward the center thereof, said plungers on their upward strokes drawing charges of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof, and means for concealing said stationary plate.

12. A can filling machine comprising a rotary turret having measuring cylinders, a hopper surrounding and extending above said turret, a stationary magazine within said turret and communicating with said hopper, means for successively drawing a charge of material from said magazine into said cylinders, a discharge port in the bottom of each cylinder, a stationary sealing plate below and adjacent said turret having a

discharge opening therein, and a plate below said stationary plate completely enclosing same.

13. A can filling machine comprising a rotary turret having measuring cylinders, a hopper surrounding said turret and extending a considerable distance above the top of same, a stationary magazine surrounded by said turret, said cylinders each having an admission port and a discharge port, said magazine having a feed port, plungers in said cylinders, a stationary plate below and adjacent said turret and provided with a discharge port and adapted to seal the discharge port of each cylinder during the charging thereof, and a base plate rotating with said hopper and adapted to enclose said stationary plate.

14. A can filling machine comprising a rotary turret having measuring cylinders, a hopper surrounding and extending above said turret, the upper face of said turret sloping downward toward the center thereof, a stationary magazine within said turret and communicating with said hopper, means for successively drawing a charge of material from said magazine into said cylinders, a discharge port in the bottom of each cylinder, a stationary sealing plate below and adjacent said turret having a discharge opening therein, and a plate below said stationary plate completely enclosing same.

15. A can filling machine comprising a rotary turret having measuring cylinders, a hopper surrounding said turret and extending a considerable distance above the top of same, the upper face of said turret sloping downward toward the center thereof, a stationary magazine surrounded by said turret, said cylinders each having an admission port and a discharge port, said magazine having a feed port, plungers in said cylinders, a stationary plate below and adjacent said turret and provided with a discharge port and adapted to seal the discharge port of each cylinder during the charging thereof, and a base plate rotating with said hopper and adapted to enclose said stationary plate.

16. A can filling machine comprising a rotary turret having measuring cylinders, a hopper surrounding and extending above said turret, a stationary magazine within said turret and communicating with said hopper, plungers for successively drawing a charge of material from said magazine into said cylinders, a discharge port in the bottom of each cylinder, a stationary sealing plate below and adjacent said turret having a discharge opening therein, and a plate below said stationary plate completely enclosing same.

17. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, means for drawing a charge of material from said hopper into said cylinders successively, a rotary base plate for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof, and an upstanding annular flange on said base plate embracing the lower end of said hopper for concealing said stationary plate.

18. A can filling machine comprising a supply hopper, a rotary turret having measuring cylinders located within said hopper, each cylinder having a discharge port, said hopper extending a considerable distance above the top of said turret, means for drawing a charge of material from said hopper into said cylinders successively, a rotary base place for said hopper, said plate having openings one of which is aligned with the discharge port of each cylinder, a stationary plate between said turret and said base plate provided with a discharge opening and adapted to seal the discharge port of each cylinder during the charging thereof, and an upstanding annular flange on said base plate embracing the lower end of said hopper for concealing said stationary plate.

19. A can filling machine comprising a rotary turret having measuring cylinders, a hopper surrounding and extending above said turret, a stationary magazine within said turret and communicating with said hopper, means for successively drawing a charge of material from said magazine into said cylinders, a discharge port in the bottom of each cylinder, a stationary sealing plate below and adjacent said turret having a discharge opening therein, and a plate below said stationary plate, said last named plate having an upstanding annular flange embracing the lower end of said hopper for completely enclosing said stationary plate.

20. A can filling machine having a hopper of two diameters, measuring cylinders surrounding the smaller diameter, and located below the larger diameter, the upper ends of said cylinders opening into the larger diameter of said hopper, plungers in said measuring cylinders, means arranged to provide for the drawing of charges of material from said smaller hopper diameter into said cylinders upon the upward movement of the plungers, and means for successively discharging the contents of said cylinders.

21. A can filling machine having a rotary hopper of two diameters, measuring cylinders surrounding the smaller diameter, and located below the larger diameter, the upper ends of said cylinders being open to the larger diameter of said hopper, plungers in said measuring cylinders, a stationary magazine within said smaller diameter provided with an elongated opening, said cylinders each having a port on the wall forming the smaller diameter of said hopper, said plungers adapted to draw charges of material into said cylinders through their respective ports and the elongated opening upon their upward strokes, and adapted to discharge the contents from said cylinders during the time the respective ports and said discharge opening are out of communication.

22. A hopper and measuring cylinder construction for can filling machines comprising a hopper having a rotating part and a stationary part, and cylinders located within the outer diameter of the rotating part and surrounding said stationary part, the surface at the top of said cylinders being substantially concave to drain material thereon into said stationary part.

23. A hopper and measuring cylinder construction for can filling machines comprising a hopper having a rotating part and a stationary part, and cylinders located within the outer diameter of the rotating part and having their upper ends communicating therewith, said cylinders surrounding said stationary part.

24. A hopper and measuring cylinder construction for can filling machines comprising a hopper having a rotating part and a stationary part, cylinders located within the outer diam-

eter of the rotating part and surrounding said stationary part, the surface at the top of said cylinders being substantially concave to drain material thereon into said stationary part and means for successively admitting material from said stationary part to said cylinders.

25. A hopper and measuring cylinder construction for can filling machines comprising a hopper having a rotating part and a stationary part, cylinders located within the outer diameter of the rotating part and having their upper ends communicating therewith, said cylinders surrounding said stationary part, and means for successively admitting material from said stationary part to said cylinders.

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