

Nov. 24, 1953

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2,660,340

MAGAZINE FOR DISPENSING MACHINES

Filed March 21, 1950

5 Sheets-Sheet 1

FIG. 1.

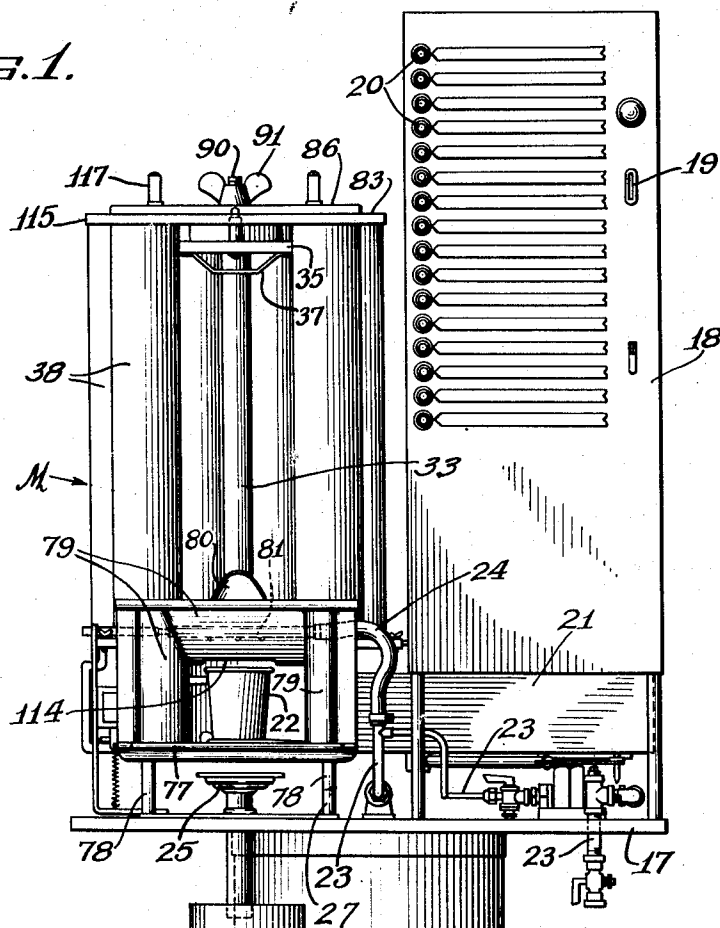
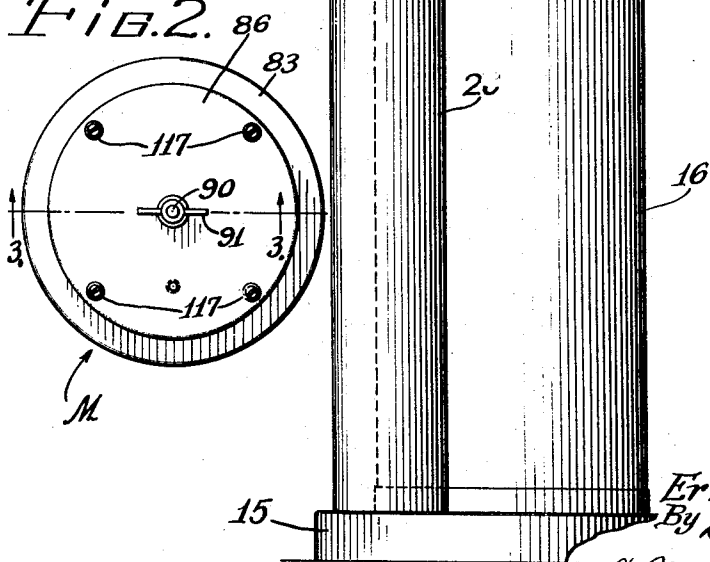


FIG. 2.



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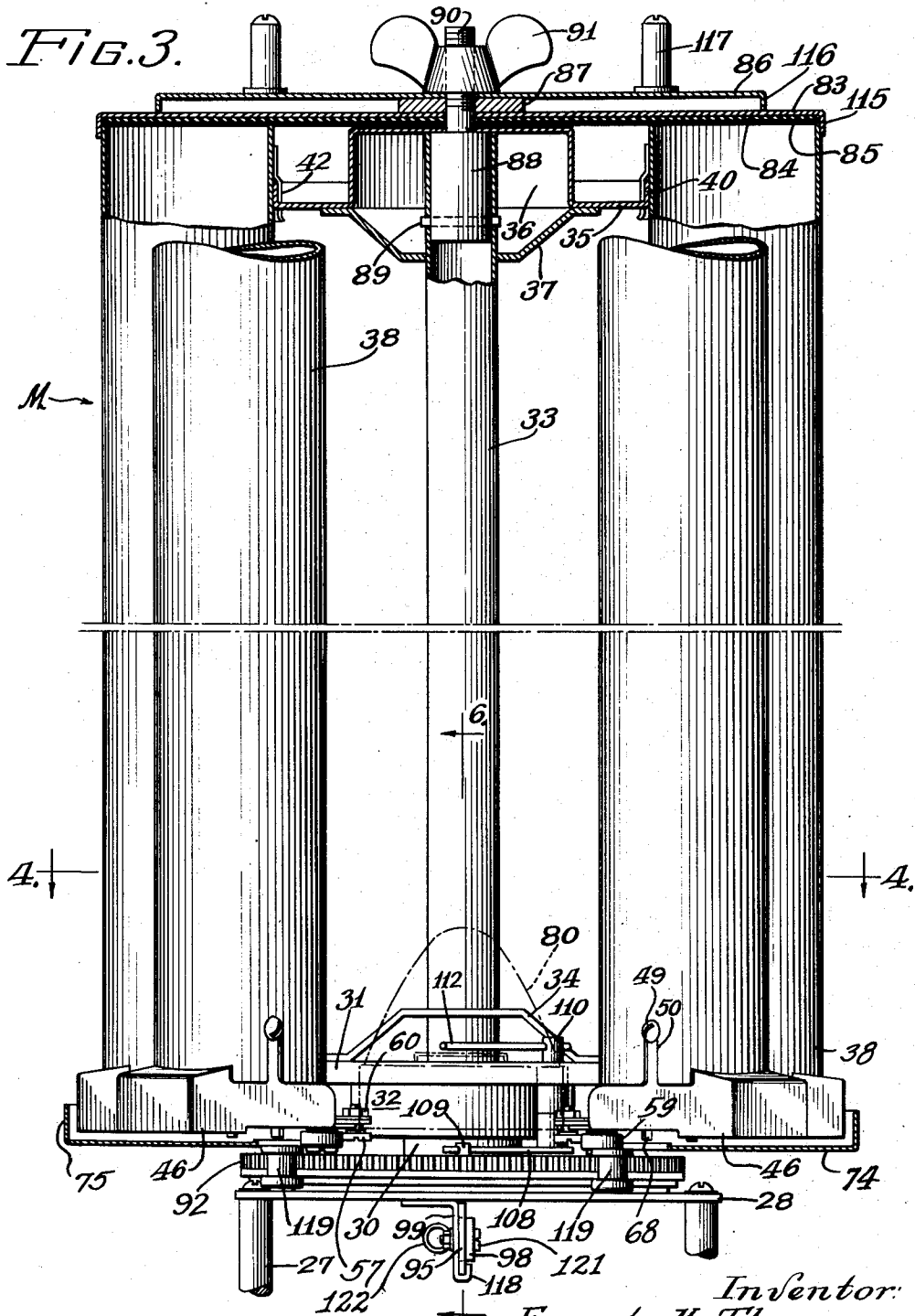
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5 Sheets-Sheet 2

FIG. 3.



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5 Sheets-Sheet 3

FIG. 4.

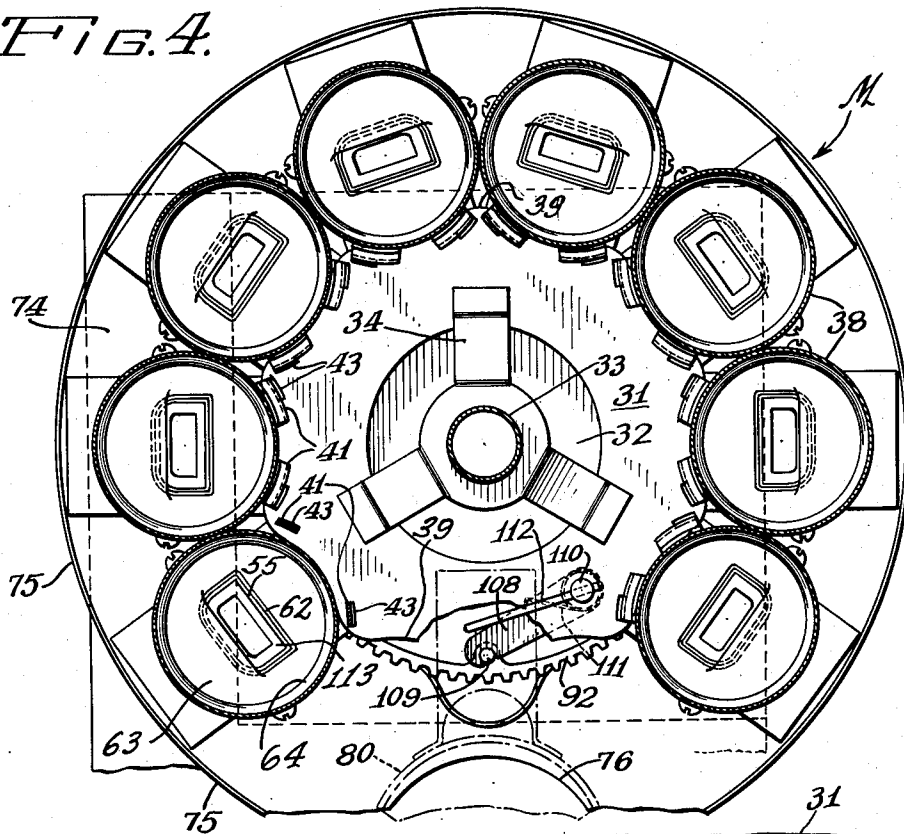
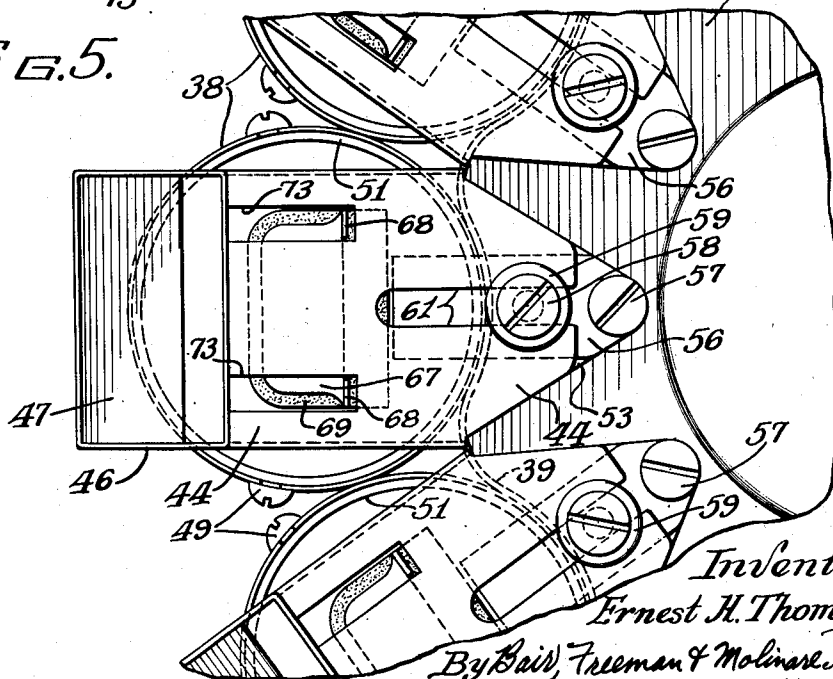


FIG. 5.



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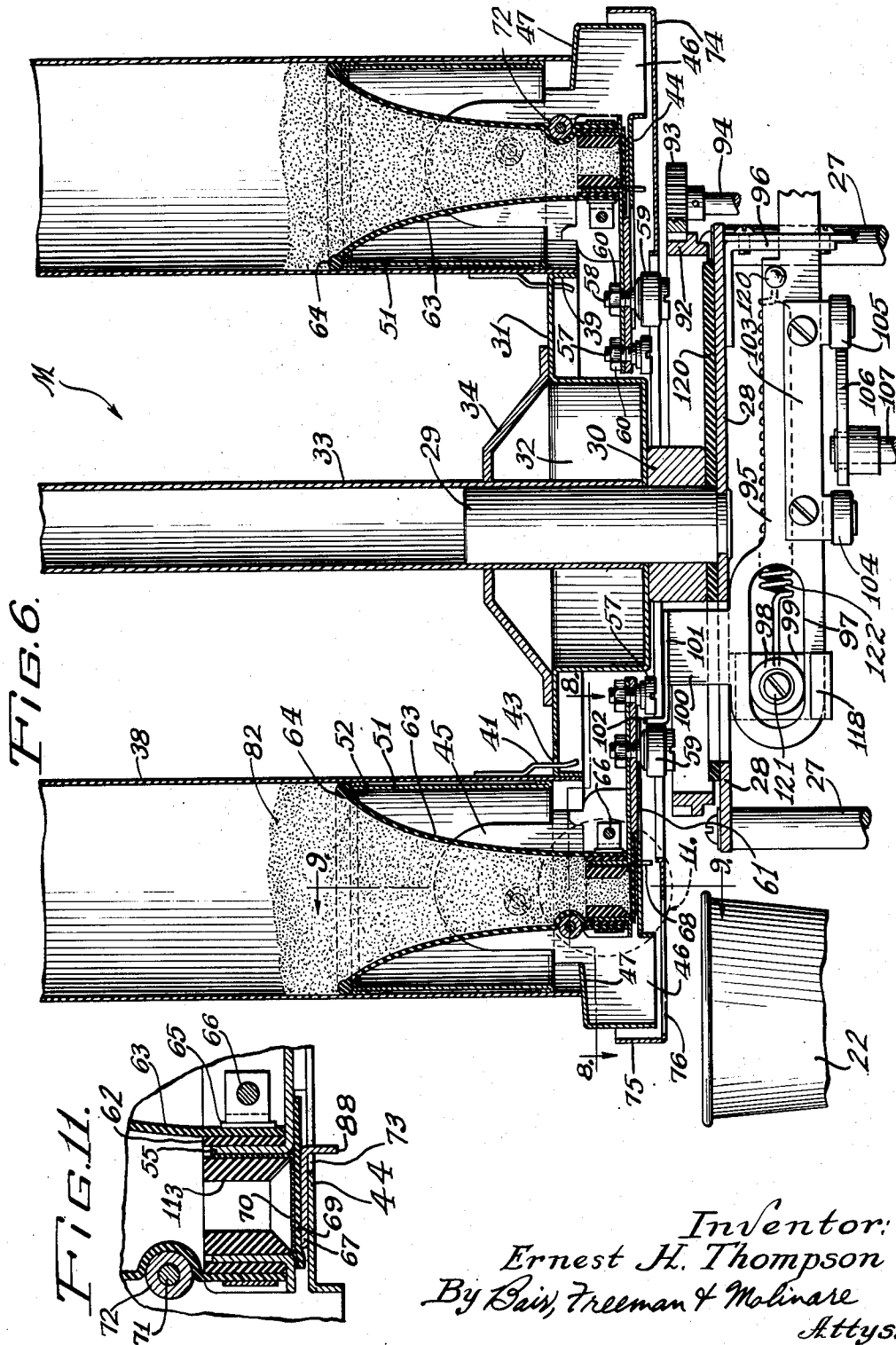
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2,660,340

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FIG. 7.

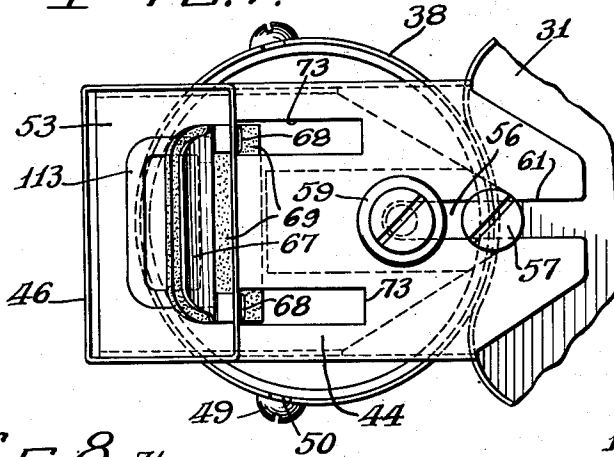


FIG. 12.

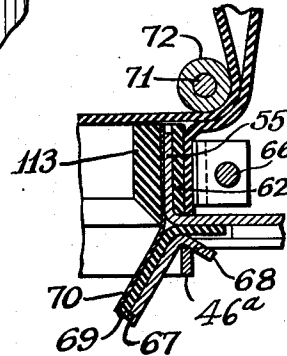


FIG. 8.

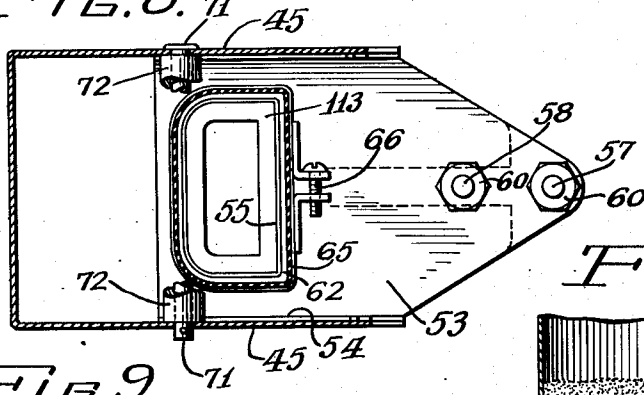


FIG. 10.

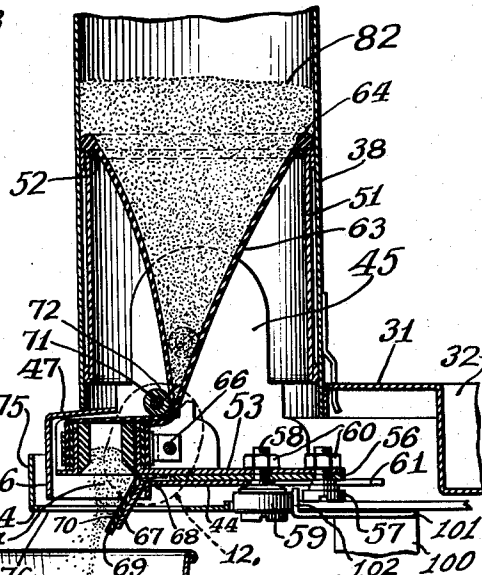
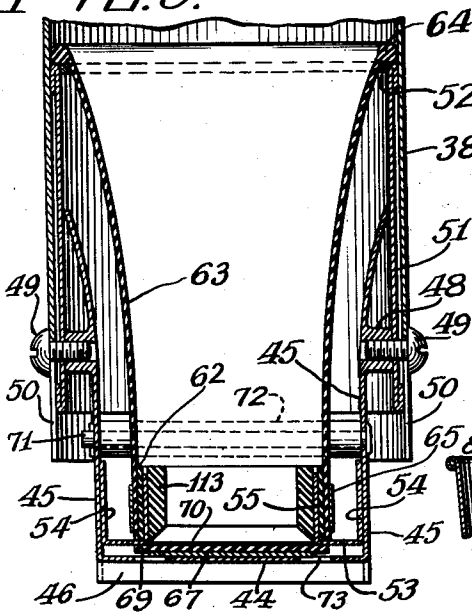


FIG. 9.



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UNITED STATES PATENT OFFICE

2,660,340

MAGAZINE FOR DISPENSING MACHINES

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Application March 21, 1950, Serial No. 150,897

20 Claims. (Cl. 222—136)

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This invention relates to a magazine for dispensing machines, and particularly those dispensing machines which dispense a product which is powdered, granular or the like, directly into a cup and which discharge water into the cup for dissolving the product.

One object of the invention is to provide a magazine element with a charge forming unit having a discharge valve, and mechanism to seal the discharge opening of the charge forming unit relative to the magazine after measuring a quantity of product received in the charge forming unit, whereupon the unit is moved to a discharge position and the charge of product discharged therefrom.

Another object is to provide a charge forming unit so constructed that it is non-clogging and non-caking even though used in connection with a powdered product and is so operated that it agitates the powdered material to prevent it from packing in the magazine.

Still another object is to provide for the operation of a charge forming unit by means of a slide, a flap valve being carried thereby and arranged to be quickly opened at the end of the stroke of the slide thereby tending to discharge all of the powdered material carried by the charge forming unit from the magazine to the cup or other receptacle receiving the same.

A further object is to provide a magazine unit including a plurality of magazine tubes which are readily detachable relative to the frame of the magazine unit and each of which has a readily removable charge forming unit so that such unit can be replaced with a minimum of time and effort.

Still a further object is to provide a novel means for sealing a magazine tube with respect to atmosphere comprising a flexible discharge spout element connected with the magazine tube at one end and with a movable charge forming unit at its other end, the charge forming unit when in a discharge position cooperating with an abutment so that the discharge spout element is closed by the abutment during the time the flap valve is open and the contents of the magazine tube thereby sealed off at this time.

An additional object is to provide a charge sizing insert for the charge forming unit to readily adjust it for a desired size of charge.

Another additional object is to provide a magazine which is adaptable for a plurality of different products in a compact space with the magazine unit capable of being indexed so that the product from any desired one of the magazine

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tubes may be dispensed at a dispensing position.

Further additional objects are to provide an effective sealing arrangement for a plurality of magazine tubes so that they may be simultaneously closed, thus minimizing servicing time; a magazine unit which is removable as a complete unit from the dispensing machine and includes magazine tubes each of which is removable together with a charge forming unit carried thereby; and each of which charge forming units is readily removable and replaceable with respect to its respective magazine tube. The arrangement is such as to facilitate the refilling of the magazine tubes and the testing thereof for leakage in addition to the testing of the charge forming units to see that they operate properly, all of which can be accomplished in a few minutes' time by an attendant so that a reasonably large number of dispensing machines may be serviced by one attendant.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my magazine for dispensing machines, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a front elevation of a dispensing machine for beverages and the like including a magazine embodying my present invention, the casing for the machine being removed.

Figure 2 is a plan view of the magazine per se.

Figure 3 is an enlarged front elevation of the magazine with the upper portion thereof broken away and the remaining portion shown in section as on the line 3—3 of Figure 2.

Figure 4 is a horizontal sectional view on the line 4—4 of Figure 3.

Figure 5 is a bottom plan view of a portion of the magazine per se on a scale twice that of Figure 4.

Figure 6 is an enlarged sectional view on the line 6—6 of Figure 3 with the magazine rotated to a position preparatory for dispensing powdered material from a magazine tube into a cup.

Figure 7 is a bottom plan view of one of the charge forming units of Figure 5 showing the parts in a discharging position.

Figure 8 is an enlarged horizontal sectional view on the line 8—8 of Figure 6.

Figure 9 is an enlarged vertical sectional view on the line 9—9 of Figure 6.

Figure 10 is a vertical sectional view similar to the left side of Figure 6 showing a charge form-

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ing mechanism in the discharging position of Figure 7.

Figure 11 is an enlargement of that portion of Figure 6 within the dotted outline 11; and

Figure 12 is an enlarged view of that portion of Figure 10 within the dotted outline 12.

On the accompanying drawings I have used the reference numeral 15 to indicate a base and 16 a supporting post extending upwardly therefrom. A platform 17 surmounts the post 16 and supports the various mechanism of a dispensing machine including the magazine indicated generally at M and embodying my present invention.

By way of general environment for my dispensing magazine, a selector panel 18 is disclosed on which a number of selector push buttons and a coin slot 19 are illustrated. A cup dispenser is indicated generally at 21 and one of the cups therefrom is shown at 22 in a position adapted to receive the materials for a beverage or the like. Water supply piping 23 is also illustrated for supplying water to a discharge nozzle 81, a hose 24 serving to connect the piping 23 to the discharge nozzle. The post 16 may contain heating means for the water but the foregoing elements form no part of my present invention. Instead they are disclosed and claimed in my copending application, Serial No. 218,666, filed March 31, 1951.

Below the cup 22 a drain 25 is preferably provided for taking care of any drippings from the cup and for permitting deposit thereof in a receptacle 26 which receptacle may also receive the used cups 22. Cups made of paper or fibre are suitable from the standpoint of economy and sanitation as well as disposal without the necessity of washing the cups as when china cups or the like are used. Obviously however china cups can be used if it is desirable to eliminate the cup dispenser 21.

Supporting posts 27 extend upwardly from the platform 17 and a supporting plate 28 is mounted on them as shown in Figure 6. A supporting pin 29 is riveted in the plate 28 and extends upwardly therefrom through a spacer 30 under which is a disc 120 of insulation for a purpose disclosed in my copending application above referred to.

My magazine unit M will now be described. It includes a disc-like base plate 31 having a depending flange 39 at its periphery which is corrugated as brought out in Figure 4 so as to have semi-circular seats for magazine tubes 38 adjacent their lower ends. The base plate 31 has a downwardly depressed portion 32 perforated to surround the supporting pin 29 and a central tube 33 also surrounds this pin and is secured as by welding to the depressed portion 32 of the base plate 31. A spider-like brace 34 is also provided for rigidly fixing the central tube 33 at right angles to the base plate.

At the top of the central tube 33, a top plate 35 is provided (see Figure 3) which is similar to the plate 31 but inverted relative thereto, being provided with an upwardly depressed portion 36 secured to the upper end of the tube 33 and braced by a spider-like brace 37. The plate 35 has an upwardly extending corrugated flange 40 for seating the magazine tubes 38 adjacent their upper ends.

The magazine tubes 38 are removable and thus renewable when required with respect to the base plate 31 and the top plate 35. This is accomplished by means of two strap-like hoops 41 adjacent the lower end of each of the tubes 38

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and similar hooks 42 adjacent their upper ends.

Referring to Figure 4, the lower left hand tube 38 has its hooks 41 cut in section to illustrate openings 43 in the base plate 31 to receive the hooks. The hooks 42 at the upper ends are similarly received in openings of the top plate 35 after the hoops 42 are hooked over the flanges 40.

Having described how the magazine tubes 38 are mounted, I will now describe a charge forming unit removably positioned in the lower end of each magazine tube. These charge forming units are described by reference numerals 44 to 73 in which 44 is the bottom of a channel shaped support. This support as shown in Figure 9 has side flanges 45 which, as illustrated in Figure 6, are somewhat narrower than the diameter of the tube 38 and rounded at their upper ends. The channel shaped support 44 further includes a substantially rectangular discharge spout 46 formed of downwardly extending flanges of the bottom member 44 and a top element 47 engaged against the lower end of the outer lower edge of the magazine tube 38.

To secure each charge forming unit in the lower end of its magazine tube 38, I provide bosses 48 on the flanges 45 as shown in Figure 9 into which screws 49 are threaded after passing through slots 50 of the tube 38 and through a sleeve 51 which forms part of the charge forming unit, the sleeve being permanently secured to the bosses 48 as by welding or soldering. The slots 50 are open at their lower ends so that the screws 49 can be loosened to permit the entire charge forming unit to be removed from the magazine tube after the tube has been removed from its supported position so that the charge forming unit can be repaired or replaced if desired or necessary.

The upper end of the sleeve 51 has an inwardly extending flange 52 which is shown as a wire ring soldered to the sleeve to serve as a support as will hereinafter appear.

Each charge forming unit includes a charge forming slide comprising elements 53 to 70 which will now be described. A channel shaped slide is shown in Figure 9 having a web 53 and flanges 54. A D-shaped flanged opening 55 is provided in the charge forming slide 53-54, the flange extending upwardly as illustrated. Referring to Figure 10, the web 53 extends from the flanged opening 55 inwardly toward the center of the magazine and has a slide plate 56 secured to its bottom surface by a stud 57 and a roller stud 58. A roller 59 is journaled on the stud 58 and both studs 57 and 58 are retained in assembled position on the web 53 and the plate 56 by nuts 60.

The studs 57 and 58 have shouldered portions slidable in a slot 61 of the bottom 44 of the channel shaped support of the charge forming unit as shown in Figures 6 and 7 so that the charge forming slide 53-54 can be moved as from the normal position of Figure 6 to the discharging position of Figure 10.

A resilient band 62 surrounds the D-shaped flanged opening 55 of the charge forming slide and the lower end of a flexible discharge spout element 63 surrounds the resilient band. The discharge spout element 63 is tubular in character being provided at its upper end with a bead 64 to rest on the upper end of the sleeve 51 and the flange 52 as shown in Figure 9. The bead 64 is slightly larger than the internal diameter of the magazine tube 38 to provide a seal between the spout element and the tube.

The spout element is made of very thin rub-

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ber, neoprene, or similar material and the resilient band 62 serves to reinforce it around the flanged opening 55, the parts being held in sealed relationship by a metal clamp band 65 and a clamp bolt 66 as shown in Figure 8. Within the D-shaped opening 55, a charge sizing element 113 is located and this may also be made of rubber, neoprene or the like, the sizing element being thus readily removable so that one of a different size can be inserted for providing a larger or smaller charge of material as will be apparent later on in my description.

A flap valve 67 is provided for the lower end of the D-shaped opening 55 and it is faced with a combination gasket and hinge element 69 which is shown stippled in Figures 5 and 7. The right hand margin of the hinge 69 is secured to the bottom of the plate 56 as by cement. The radially inner end of the flap valve 67 terminates in a pair of projections or actuating flanges 68 adapted to travel in slots 73 of the bottom plate 44 of the charge forming unit 44-45. A membrane 70 is secured to the upper surface of the gasket 69 and passes up between the flange 55 of the D-shaped opening and the charge sizing element 113 as shown in Figure 12 to seal off any crack between the flange 55 and the gasket 69 in which powdered material might cake and cause improper operation of the flap valve.

Referring to Figures 8, 9 and 10, the flanges 45 carry a pin 71 on which an abutment in the form of a roller 72 is mounted to seal off the charge forming unit 44-45 from the magazine tube at the time the product is discharged from the charge forming unit as will hereinafter appear.

Under all the magazine tubes 38 as shown in Figure 4, a catch plate 74 is provided having an upwardly extending flange 75 around its periphery and a discharge opening 76 through which the product is discharged from the charge forming unit to the cup 22 as shown in Figure 10.

Referring to Figure 1, the cup 22 is placed on a cup supporting plate 77 which in turn is supported by posts 78 extending upwardly from the platform 17 and located in front of the posts 27 in Figure 1. Cup guards 79 are provided adjacent the sides and top of the cup and the top guard is provided with an opening 114 through which the product 82 from the magazine tubes 38 is discharged along with the water from the nozzle 81. A splash guard 80 is mounted back of the nozzle and this guard is shown by dot-and-dash lines in Figures 3 and 4 to show its location. Any water that is splashed from the cup 22 as it is discharged from the nozzle 81 is thus kept from splashing on to the two adjacent magazine tubes 38 and their charge forming units. As disclosed, there are eight tubes which are 36° apart with two omitted at the front so that they are well away from the cup position. During operation as disclosed in my copending application, a selected one of the tubes is rotated to a position over the cup for discharge of a charge of product therefrom and the assembly of tubes is then rotated to the position of Figure 4 before the water is discharged into the cup.

A cover is provided for the magazine tubes comprising a cover plate 83 circular in outline as shown in Figure 2 and having a depending flange 115 passing around the outer surface of the tubes (see Figure 3). This plate is lined with a gasket 84 and a wax paper cover for the gasket may be provided as indicated at 85 if desired. A reinforcing disc 86 is provided for the cover plate 83

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and it also has a depending flange 116 which may be soldered to the plate 83 with a spacer washer 87 interposed between the two at the center. The assembly of plate 83 and disc 86 are held in position on the upper ends of the magazine tubes 38 by means of a stud 88 secured in the upper end of the central tube 33 by a pin 89. The stud has a threaded extension 90 on which a wing nut 91 is screwed. A plurality of projections 117 serve as supporting legs and the central tube 33 serves as a handle during servicing operations when the magazine M is removed from the supporting pin 29 and inverted.

During the automatic operation of the dispensing machine as described in my copending application, the magazine tubes 38 are properly indexed in accordance with one of the selector buttons 20 depressed by the customer. The indexing means forms no part of my present invention but I will describe briefly the drive for accomplishing the indexing.

Referring to Figure 6, a ring gear 92 is rotatably mounted on the supporting plate 28 by means of a plurality of spool-like rollers 119 shown in Figure 3. A pinion 93 is provided for driving the ring gear and this pinion is mounted on a shaft 94 with which a suitable drive means may be connected such as shown in my copending application.

Referring to Figures 3 and 4, the manner of connecting the magazine M to the ring gear 92 for rotation therewith comprises a connecting hook 103 adapted to coact with a pin 109 carried by the ring gear. The hook 103 is secured to a short rock shaft 110 that is journaled in the magazine base plate 31 and a spring 111 tends to engage the hook with the pin. A rod-like lever 112 extends from the rock shaft 110 above the plate 31 to be engaged by the attendant servicing the machine for swinging the hook against the action of the spring to unhook it from the pin. The entire magazine may then be readily lifted by the attendant from the supporting pin 29 by grasping the central tube 33 after passing his hand through the space between the two lower magazine tubes in Figure 4.

For driving the charge forming units, I provide a slide 95 best shown in Figure 6 having one end extending through a suitable slot in a bracket 96 and its other end slotted as at 97 to coact with a roller 98. The roller 98 is mounted on a bracket 99 extending downwardly from the supporting plate 28 and the bracket has an upturned flange 118 to retain the slide plate 95 in position. The slide plate has a vertical extension above the slot 97 terminating in a horizontal flange 101 provided with an upturned finger 102 adapted to coact with the roller 98 and the stud 57 of any charge forming unit registered therewith.

A bracket 103 is secured to the slide 95 and carries a discharge roller 104 and a return roller 105. A cam 106 coacts with these rollers for reciprocating the slide 95 and is mounted on a drive shaft 107 which is driven in any suitable manner and at the proper time as also disclosed in my copending application. The cam 106 is of the type having a sudden drop to permit a spring 122 connected between the stud 121 on which the roller 98 is mounted and a stationary stud 120 to drive the slide 95 quickly in the charge discharging direction.

Practical operation

I will first describe the operation of one of

the charge forming units. They, of course, are all alike and the one that does operate during a given dispensing cycle depends upon the indexed position of the magazine unit M at the time of operation. Referring to Figure 6, the left magazine tube 38 may be any one of the eight tubes which has been rotated to the cup opening 76 of Figure 4 by rotation of the shaft 94 and through the pinion 93, the ring gear 92, and the hook and pin connection 108-109, rotation of the entire magazine unit is effected.

After the magazine is indexed in the manner just described as a result of pushing a selected one of the push buttons 20 in Figure 1 as more fully disclosed in my copending application, the left hand charge forming unit in Figure 6 is ready for operation. It will be noted that the flap valve 67 is closed so as to retain the powdered material 82 or other product against discharge. As shown more clearly in Figure 11, closure is effected by the flap valve riding on the bottom 44 of the charge forming unit and the spacing of the parts is such that the flap valve is tight against the gasket and hinge element 69 and in fact presses it so tightly against the bottom of the flanged opening 55 that the edge of the gasket is somewhat flexed out of its original plane thus forming an effective air tight seal. The flap valve is also somewhat smaller than the size of the flanged opening as also shown in Figure 9 in order to contribute to this desirable result.

The stud 57 and the roller 59 of the left hand charge forming unit in Figure 6 is in position to be actuated by the cam 106 on the shaft 107, as it is only when a magazine tube 38 is at the position of the cup opening 76 that its stud and the roller are in alignment with the flange 102 of the slide 95 to be actuated thereby.

When the shaft 107 rotates, the cam 106 will rotate slightly to release the slide 95 which is then driven by the spring 122 toward the left and this moves the slide plate 56 quickly from the position of Figures 6 and 11 to the position of Figures 10 and 12.

The first movement toward the left causes the right side of the discharge spout element 63 to approach the left side as the left side is held by the roller 72. Finally, the right side touches the left side as in Figure 10 and thereafter further movement stretches the discharge spout element and draws it around the roller to the final position illustrated in Figures 10 and 12. The first contact of the right side of the discharge tube with the left side cuts off the interior of the magazine tube with respect to the interior of the charge sizing element 113 in an air-tight manner so that no air from the charge forming unit when it is opened will get back into the magazine tube. I find this a very effective mechanism for accomplishing the desired sealing results.

Adjacent the end of the spring propelled travel of the slide plate 56 in a left hand direction, the actuating flanges 68 which have heretofore freely traveled in the slots 73 of the bottom plate 44 of the charge forming unit will engage an abutment comprising the radially inner flange of the discharge spout 46 which is indicated as 46a in Figure 12 and this quickly throws the flap valve 67 to the open position illustrated in Figure 10 for discharging a charge of the product indicated as 82a therein.

The quick opening of the flap valve permits the charge of product to be rapidly discharged with

a somewhat violent action of the flap valve to shake any loose particles therefrom. Likewise when the cam 106 returns the slide 95 to its original position of Figure 6, the first movement is a slamming shut of the flap valve due to the valve riding over the flange 46a of Figure 12 and this flange thereby closing the valve quickly after which it is retained closed by the plate 44 as in Figure 11 during the rest of the return stroke and during the next forward stroke until the actuating flanges 68 again strike the flange 46a.

After the slide 95 has returned to the position of Figure 6, then the magazine unit is indexed around to the original position of Figure 4 whereupon a charge of hot water or the like is discharged from the nozzle 81 into the cup 22 to dissolve the charge of powdered product 82 therein, all as more fully disclosed in my copending application.

With respect to constructional features of the charge forming unit, it will be noted that the flanges of the flanged opening 55 terminate somewhat below the upper edges of the charge sizing unit 113 and the resilient band 62 as shown in Figures 11 and 12. Thus the charge sizing unit and the resilient band protect the relatively thin discharge spout element from contact with metal that might chafe or puncture it.

The siding element 113 being in the form of an insert can be readily removed and replaced with one of more or less internal size depending on the product being dispensed from a specific magazine tube. Since the insert is of resilient material, it can be merely slipped in or out as desired, this being accomplished after removal of the entire charge forming unit by loosening the screws 49 while the magazine tube of course is removed from its supported position in the magazine unit. This arrangement also permits ready replacement of any charge forming unit that is operating improperly so that the attendant can quickly check each unit as to its operation and replace any if necessary in a minimum of time.

I have omitted all reference to a casing for the magazine unit M and other mechanism such as the cup dispenser 21 and the piping 23. In actual practice, of course, such a casing would be provided but forms no part of my presently claimed invention.

The magazine unit is readily serviced by an attendant in the following disclosed manner. First, the cover plate 93 is removed after removing the wing nut 91. The individual tubes 38 may then be refilled with the appropriate products 82. The lever 112 of Figure 4 is then rotated clockwise against the action of the spring 111 to unhook the hook 108 from the pin 109. The magazine unit is then free to rotate to any desired position for filling or removing individual magazine tubes or for removing the entire magazine unit itself.

After the unit is removed, it may be inverted and rest on the four legs 117 on any suitable supporting surface such as a floor or table. This causes the product in the various tubes to settle away from the charge forming units and they can be individually manually operated to determine if they are operating properly. Any that are not can be readily removed, inspected and replaced after any trouble has been remedied or a new properly operating unit can be substituted.

The inversion of the magazine unit also serves to indicate to the attendant whether or not the cover plate 93 is properly installed with all maga-

zine tubes sealed at the top against entrance of air since any leakage of powder at that time can be detected. If there is no leakage then the magazine unit can be turned right-side-up and replaced if the attendant is sure that all the charge forming units are operating properly.

From the foregoing specification, it is obvious that I have provided a magazine unit for dispensers which is so designed as to dispense the product directly into a cup from which the beverage is drunk. The magazine tubes are sealed against moisture which is detrimental to many powdered products such as powdered coffee and powdered tea and the tops of the magazine tubes are sealed by the gasket 84 whereas the lower ends are sealed at all times by either the flap valves being closed or the discharge spout elements 63 assuming the position shown in Figure 10 when the flap valves open. These discharge spout elements are of such character that, during operation, they agitate the product in the magazine tubes to prevent it from packing and therefore being improperly fed to the charge forming units.

The charge forming units are readily accessible for cleaning when the magazine unit is removed and inverted and this unit may be readily removed for inspection and periodic cleaning. The charge forming units are individually interchangeable and readily replaceable. They are also readily adjustable for the quantity of a particular product that should be dispensed for one cup of beverage by the use of the charge sizing inserts 113.

The resulting arrangement makes the entire dispenser capable of quick and sanitary servicing because of the readily demountable features described in the foregoing specification.

Some changes may be made in the construction and arrangement of the parts of my magazine for dispensing machines, without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. In a magazine for dispensing machines, a magazine tube adapted to contain a powdered product or the like, a charge forming unit adjacent the lower end of said magazine tube, said charge forming unit comprising a movable element having a receptacle to receive a charge of product from said magazine tube, a valve for normally closing the bottom of said receptacle, a flexible tube connecting said magazine tube and said receptacle, said charge forming unit being movable from one position wherein said receptacle is open through said flexible tube to said magazine tube, to another position where it is offset relative thereto, an abutment engaging said flexible tube for closing the sides thereof against each other as said charge forming unit is moved to said offset position, and means for opening said valve after said flexible tube sides have contacted each other.

2. A magazine of the character disclosed comprising a receptacle for powdered product or the like, a charge forming unit for said receptacle comprising an element movable relative to said receptacle and having a charge receiving pocket, a valve normally closing said pocket, a flexible resilient tube providing a moisture-proof sealed connection between said pocket and said receptacle, an abutment adjacent said tube, said

charge forming unit being movable from one position with said pocket open through said connection to said receptacle, to another position where it is offset relative thereto, an abutment engaging said abutment as said pocket moves to said another position and the opposite sides of said tube being thereby in contact, and means for opening said valve quickly at the end of the movement of said charge forming unit to said another position and closing it quickly at the beginning of the movement in the reverse direction.

3. In a magazine structure, a magazine tube, a charge forming unit connected with the lower end of said magazine tube, said charge forming unit comprising a movable element having a receptacle to receive a charge of product from said magazine tube, a flap valve for normally closing the bottom of said receptacle, a flexible resilient tubular connection between said magazine tube and said receptacle, said charge forming unit being movable from one position wherein said receptacle is open through said flexible connection to said magazine tube, to another position where it is offset relative thereto, an abutment engaging said flexible connection for closing the sides thereof against each other when said charge forming unit is in said another position, and means for opening said flap valve at the end of the movement of said charge forming unit to said another position and closing it at the beginning of its return movement.

4. In a magazine for dispensing machines, a magazine tube, a charge forming unit adjacent the lower end of said magazine tube and comprising a slide plate having a receptacle to receive a charge of product from said magazine tube, a valve normally closing said receptacle, a flexible tube connecting said magazine tube and said receptacle, said slide plate being movable from one position wherein said receptacle is open through said flexible tube to said magazine tube, to another position where it is offset relative thereto, means engaging said flexible tube for closing the sides thereof against each other when said slide plate is in said offset position, and cam means for moving said slide plate, said valve being hingedly connected to said slide plate and provided with an actuating flange adjacent the hinge connection, said charge forming unit including a stationary element with which said actuating flange engages adjacent the end of the movement of said slide plate to discharging position for opening said valve and having a stationary plate engaging said valve to retain it closed in all other positions thereof.

5. In a magazine of the character disclosed, a magazine tube adapted to contain powdered or granular product, a charge forming unit detachably connected with the lower end of said magazine tube, said charge forming unit comprising a slide plate having a receptacle for a charge of product from said magazine tube, a flap valve hinged to said slide plate for normally closing said receptacle, a flexible connection to conduct the product from said magazine tube to said receptacle, said slide plate being movable from one position wherein said receptacle is open through said flexible connection to said magazine tube, to another position where it is offset therefrom, an abutment engaging said flexible connection for closing the sides thereof against each other as said slide plate is moved to said another position, said flap valve having a projection therefrom adjacent its hinge, and said charge forming

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unit including a stationary element with which said projection engages adjacent the end of the movement of said slide plate to discharging position for opening said flap valve.

6. In a magazine of the character disclosed, a magazine tube adapted to contain powdered or granular product, a charge forming unit, said charge forming unit comprising a slide plate having a receptacle for a charge of product from said magazine tube, a valve hinged to said slide plate for normally closing said receptacle, a flexible resilient tube providing a moisture-proof sealed connection to conduct the product from said magazine tube to said receptacle, said slide plate being movable from one position wherein said receptacle is open through said tube to said magazine tube, to another position where it is offset therefrom, a supporting plate for said valve when in said one position, said supporting plate terminating short of said valve when in said another position, said valve having a projection therefrom adjacent its hinge, and said supporting plate including a stationary element with which said projection engages adjacent the end of the movement of said slide plate to discharging position for opening said valve.

7. In combination, a magazine tube adapted to contain a powdered product or the like, a charge forming unit for such product comprising a movable element having a receptacle to receive a charge of the product, a valve plate having a gasket normally closing said receptacle, said charge forming unit being movable from one position wherein it receives product from said receptacle to another position for discharge of the product from said receptacle, said charge forming unit comprising a slide plate to which said valve plate is hingedly connected by a portion of said gasket and thereby movable with said receptacle, said valve plate having an actuating flange adjacent the hinge connection, said charge forming unit including a stationary element with which said actuating flange engages adjacent the end of the movement of said slide plate and receptacle to discharging position for opening said valve plate and having a supporting plate engaging with said valve plate and arranged parallel to its plane of movement to retain it closed in all other positions thereof.

8. In a dispensing machine of the character disclosed, a magazine tube adapted to contain powdered, granulated or similar product, a charge forming unit detachably connected with the lower end thereof and comprising a frame having a discharge opening and a frame plate adjacent said opening and in a plane parallel thereto, said charge forming unit including a slide plate engaging and slidable along the surface of said frame plate and provided with a receptacle to receive the product from said magazine tube, a flap valve hinged to said slide plate and thereby movable with said receptacle, said flap valve normally closing said receptacle and normally sliding on said frame plate and having an actuating flange extending through a slot thereof, means for effecting sliding of said slide plate relative to said frame plate from a position in alignment with said magazine tube to a position offset therefrom, said flap valve being quickly and forcibly opened adjacent the end of the stroke of said slide plate to discharge position by engagement of said actuating flange with the forward end of said slot, and means for returning said slide plate to its initial position.

9. In a dispensing machine of the character

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disclosed, a magazine tube, a charge forming unit comprising a frame having a discharge opening and a frame plate adjacent said opening, said charge forming unit including a slide plate slidable on said frame plate and provided with a receptacle thereabove to receive the product from said magazine tube, a flap valve hinged to said slide plate and normally closing the lower end of said receptacle, said flap valve normally sliding on said frame plate and having an actuating flange along the hinged edge thereof extending through a slot thereof, and means for effecting sliding of said slide plate relative to said frame plate from a position in alignment with said magazine tube to a position offset therefrom, said flap valve being positively opened adjacent the end of the stroke of said slide plate to discharge position by engagement of said actuating flange with a stationary abutment of said frame plate.

10. In a dispensing magazine, a magazine tube adapted to contain powdered, granulated or similar product, a charge forming unit comprising a frame having a discharge opening and a horizontal frame plate adjacent said opening, said charge forming unit including a slide plate slidably engaged with said frame plate and provided with a receptacle thereabove to receive the product from said magazine tube, a flap valve normally closing the lower end of said receptacle, said flap valve normally traveling on said frame plate and retained closed thereby, said flap valve having along its rear edge an actuating flange extending through a slot of said frame plate, means to effect sliding of said slide plate relative to said frame plate from a position in alignment with said magazine tube to a position offset therefrom, said flap valve being quickly opened adjacent the end of the stroke of said slide plate to discharge position by engagement of said actuating flange with the forward end of said slot of said frame plate, a support for said magazine tube adapted to have a plurality of the magazine tubes removably supported thereon, and a single cover plate for said plurality of tubes provided with a single gasket to span all of their upper ends and seal each of them against entrance of moisture thereto, each of said magazine tubes having one of said charge forming units connected therewith.

11. In a dispensing magazine, a magazine tube, a charge forming unit therefor including a slide plate provided with a receptacle to receive the product from said magazine tube and a flap valve for said receptacle, an indexable support for said magazine tube adapted to have a plurality of the tubes removably supported thereon and providing for the positioning of said support with a predetermined one of said magazine tubes in a discharge position, a common cover plate for said plurality of tubes provided with a gasket to span all their upper ends, and a single hold-down means for said common cover each of said magazine tubes having one of said charge forming units removably connected therewith.

12. In combination, a magazine tube adapted to contain powdered or similar product, a charge forming unit detachably connected with the lower end thereof and comprising a slide plate provided with a receptacle to receive the product from said magazine tube, a flap valve normally closing said receptacle, a flexible resilient tubular connection between said receptacle and said magazine tube for directing the product from

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the tube to the receptacle, an abutment adjacent said flexible resilient tube, said slide plate when in a discharging position drawing said resilient tube across said abutment for closing the sides thereof together to seal the interior of the magazine tube with respect to said receptacle, and means for opening said flap valve adjacent the end of the stroke of said slide plate to said discharging position.

13. In a magazine for dispensing machines, magazine tubes, supporting elements having seats for said magazine tubes, hook elements on said tubes for engaging said support to hold said tubes in supported position thereon, a single cover plate for the upper ends of all said tubes, means for drawing said cover plate toward said supporting elements to thereby tighten said cover plate against the tubes, and a removable charge forming unit connected with the lower end of each magazine tube and comprising a frame member including a frame plate having a discharge opening therein, a slide plate slidable on said frame plate and having a receptacle open at the top, a flap valve for closing the bottom thereof, said flap valve being adapted for sliding on said first plate, a resilient flexible tube having its upper end sealed in said magazine tube and its lower end sealed to said receptacle, an abutment adjacent the side of said resilient tube above said receptacle, said receptacle being movable under the abutment for closing the sides of said resilient tube due to engagement of the tube with the abutment when the receptacle is offset from the magazine tube, means for propelling said slide plate to the offset position with said flap valve in said discharge opening, said flap valve having a projection engageable with said frame plate for opening the valve at that time, said frame plate reclosing the valve when the slide plate travels in the opposite direction, and means for hinging said flap valve to said slide plate comprising a combined gasket and hinging element of resilient material, said flap valve being slightly smaller than said receptacle to bend the edge of said gasket into the receptacle in the closed position of the valve.

14. In a magazine for dispensing machines, magazine tubes, supporting elements having seats for said magazine tubes, a single cover plate for the upper ends of all said tubes, means for drawing said cover plate toward said supporting elements to thereby tighten said cover plate against the tubes, and a removable charge forming unit connected with the lower end of each magazine tube and comprising a frame member including a frame plate having a discharge opening therein, a slide plate slidable on said frame plate and having a receptacle open at the top, a flap valve for closing the bottom thereof, said flap valve being adapted for sliding on said first plate, a flexible tube having its upper end sealed in said magazine tube and its lower end sealed to said receptacle, an abutment adjacent the side of said resilient tube above said receptacle, said receptacle being movable under the abutment for closing the sides of said resilient tube due to engagement of the tube with the abutment when the receptacle is offset from the magazine tube, and means for propelling said slide plate to the offset position with said flap valve in said discharge opening, said flap valve having a projection engageable with said frame plate for opening the valve at that time, said frame plate reclosing the valve when the slide plate travels in the opposite direction.

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15. In a magazine for dispensing machines, a support for a plurality of magazine tubes which are removably mounted on said support, a cover plate for the upper ends of said tubes, means for tightening said cover plate against the tubes, said means being connected with said support, and a charge forming unit connected with each magazine tube and comprising a slide plate having a receptacle open at the top, a flap valve for closing the bottom thereof, a resilient flexible tube having its upper end sealed in said magazine tube and its lower end sealed to said receptacle, an abutment adjacent the side of said resilient tube above said receptacle, said receptacle being movable under the abutment to a position offset from said magazine tube for closing the sides of said resilient tube, means for propelling said slide plate to the offset position, and said flap valve having a projection engageable with a stationary element for opening the valve at that time.

16. In a magazine for dispensing machines, a magazine supporting element having seats for the opposite ends of magazine tubes, hook means for supporting said tubes in position thereon, a common cover plate for the upper ends of said tubes, means for tightening said cover plate in sealed relation to all of the tubes, and a removable charge forming unit connected with the lower end of each magazine tube and comprising a slide plate provided with a receptacle to receive the product from said magazine tube, and a flap valve normally closing said receptacle, a flexible connection between said receptacle and said magazine tube for directing the product from the tube to the receptacle, an abutment adjacent said flexible connection, said slide plate when in a discharge position drawing said flexible connection across said abutment for closing the sides thereof together to seal the interior of the magazine tube with respect to said receptacle, and means for opening said flap valve adjacent the end of the stroke of said slide plate to discharge position.

17. In a magazine for dispensers and the like, a magazine tube adapted to contain powdered material or the like, a charge forming unit for the lower end thereof and comprising a pair of channel-shaped members, the first channel-shaped member being stationary relative to the magazine tube and the second one slidable in relation thereto, said second channel-shaped member having a flanged opening, a flexible resilient tube flared outwardly at its upper end, said upper end being sealed in said magazine tube and its lower end being sealed around said flanged opening, said second channel-shaped member being slidable from a position with said flanged opening in alignment with said magazine to a position offset therefrom, an abutment carried by said first channel-shaped member for said resilient tube to engage during such sliding movement, said abutment closing the sides of said resilient tube together for sealing said magazine relative to said flanged opening, said second channel-shaped member carrying a flap valve for said flanged opening, said flap valve having a projection engageable with said first channel-shaped member for effecting opening of said flap valve at the end of the stroke of said second channel-shaped member to discharge position.

18. In combination, a magazine tube, a charge forming unit removably connected with the lower end thereof and comprising a pair of channel-shaped members, one slidable within the other, the slidable channel-shaped member having a

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flanged opening, a flexible resilient tube from said magazine tube to said flanged opening, means carried by said first channel-shaped member for said resilient tube to engage for closing the sides of said resilient tube together for sealing said magazine relative to said flanged opening, said second channel-shaped member carrying a flap valve for said flanged opening, and means for opening said flap valve at the end only of the stroke of said second channel-shaped member to discharge position.

19. In a magazine for dispensers and the like, a magazine tube adapted to contain powdered or similar material, a charge forming unit comprising a pair of channel-shaped members, the first channel-shaped member being stationary relative to the magazine tube and the second one slidable in relation thereto, said second channel-shaped member having a charge carrying pocket, a flexible resilient tube sealed at its upper end in said magazine tube and at its lower end to said pocket, said slide plate being slidable from a position with said pocket in alignment with said magazine to a position offset therefrom, an abutment carried by said first channel-shaped member for said resilient tube to engage during such sliding movement, and valve carried by said second channel-shaped member for said pocket which is operable to the open position only at the end of the stroke of said second channel-shaped member to discharge position.

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20. In a dispensing magazine of the character disclosed, a magazine tube, a charge forming unit detachably connected with the lower end thereof and comprising a frame having a discharge opening and a slide plate provided with a receptacle to receive the product from said magazine tube, a flap valve normally closing said receptacle, a flexible resilient tube extending from said receptacle to said magazine tube for directing the product from the tube to the receptacle, said receptacle having a removable sizing insert, an abutment adjacent said flexible resilient tube, said slide plate when in an offset position relative to said magazine tube drawing said resilient tube around said abutment for closing the sides of the resilient tube to seal the interior of the magazine tube with respect to said receptacle, and means for quickly opening said flap valve adjacent the end of the stroke of said slide plate to said offset position.

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