

Dec. 27, 1966

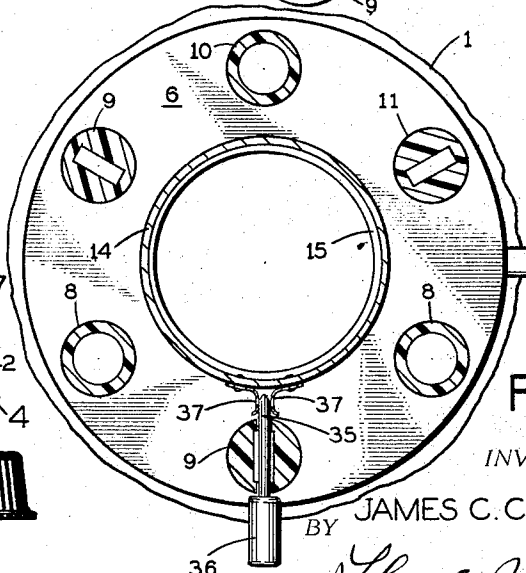
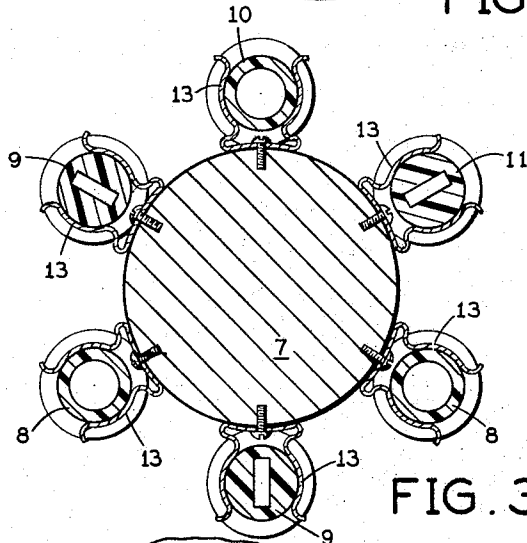
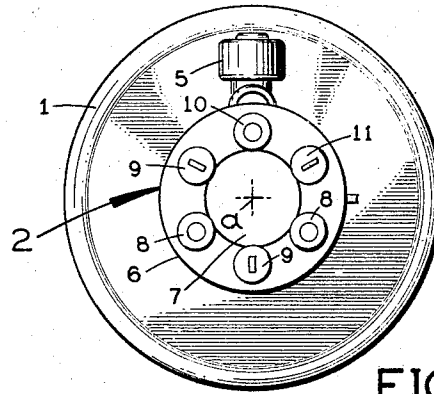
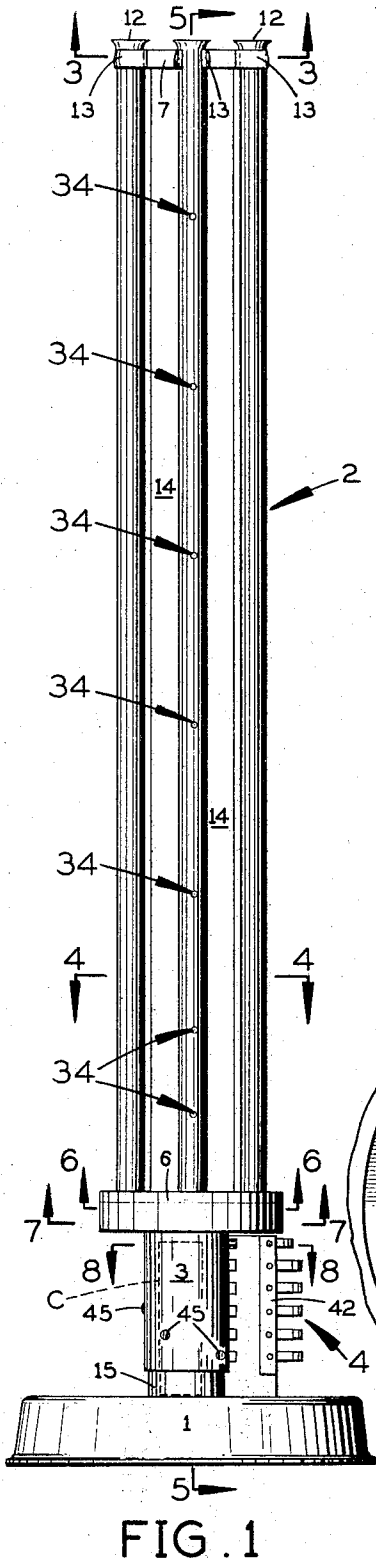
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3,294,284

ARTICLE DISPENSER WITH ROTATABLY MOUNTED MAGAZINES

Filed May 26, 1965

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

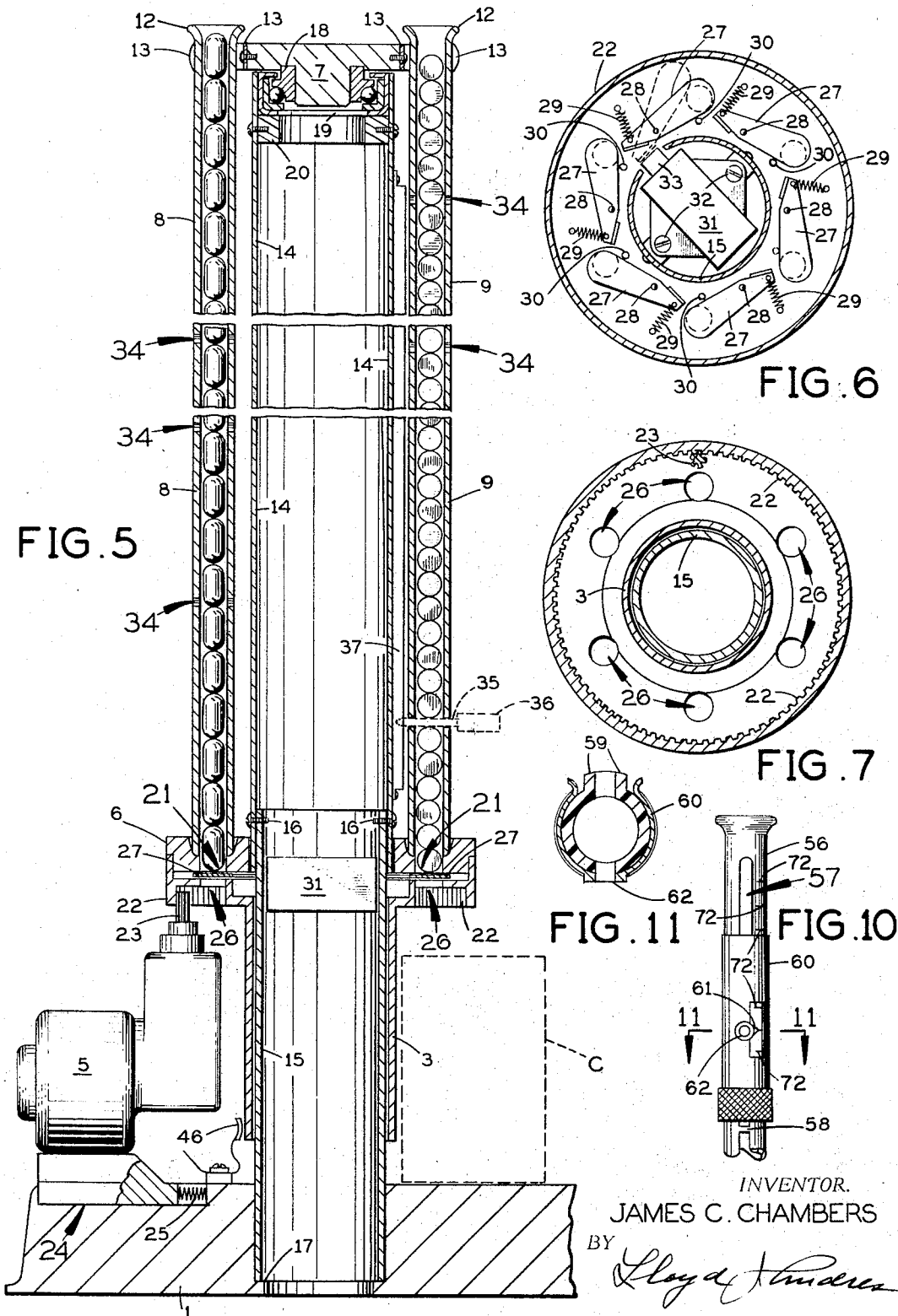


FIG. 5

FIG. 6

FIG. 7

FIG. 11

FIG. 10

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4 Sheets-Sheet 3

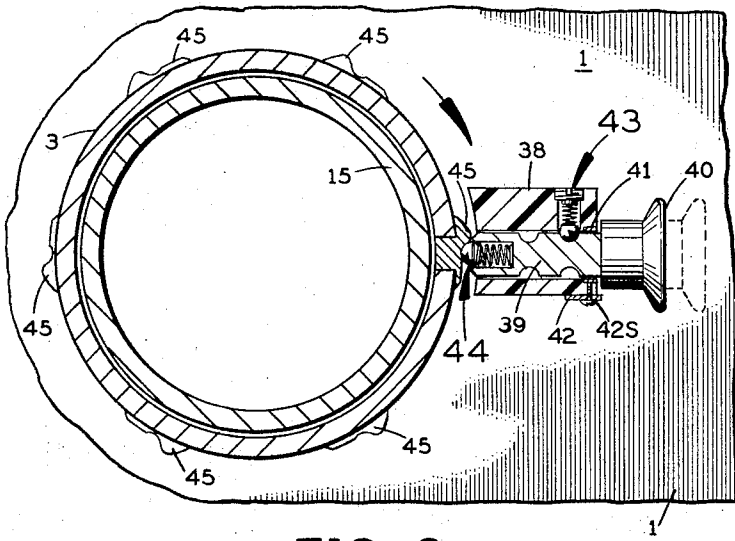
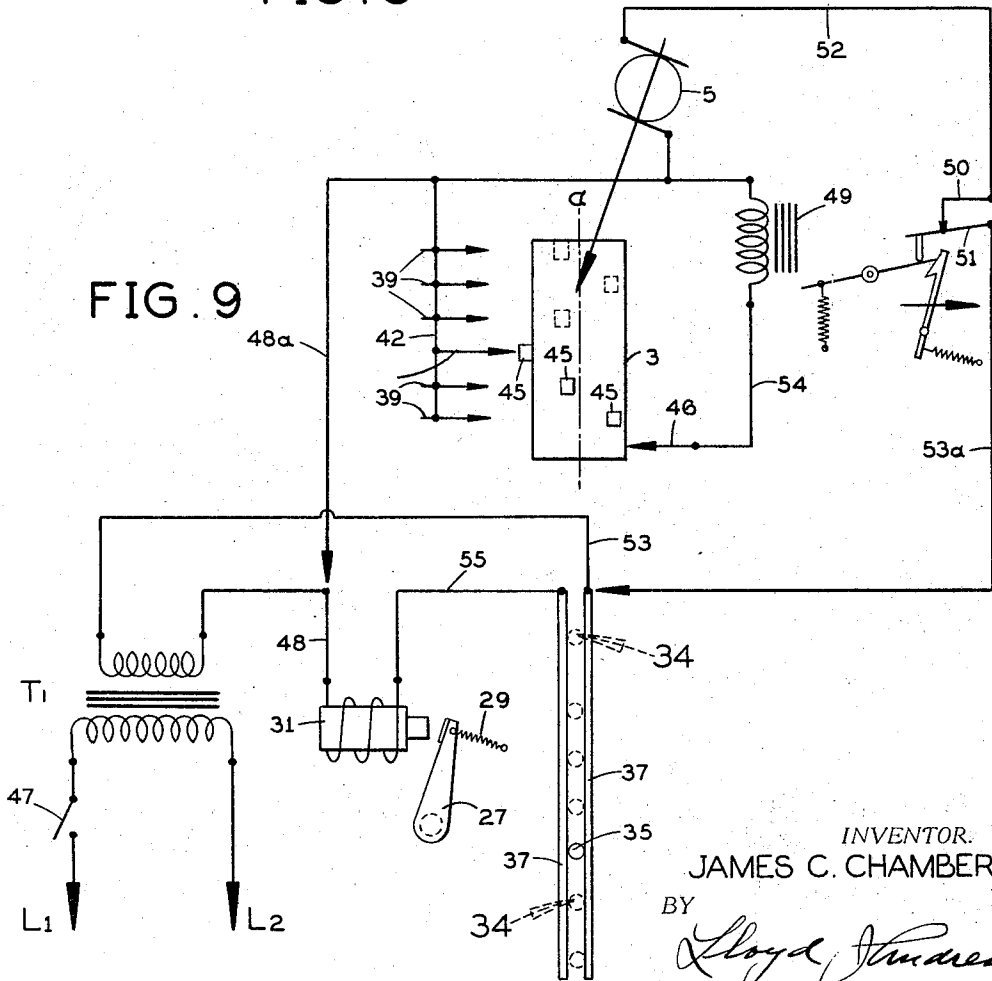


FIG. 8



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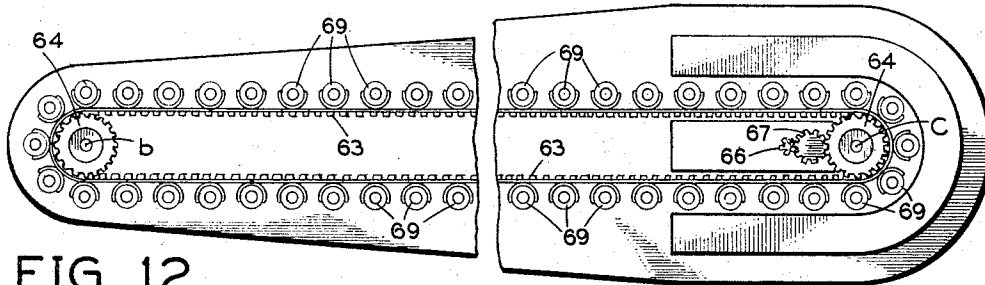


FIG. 12

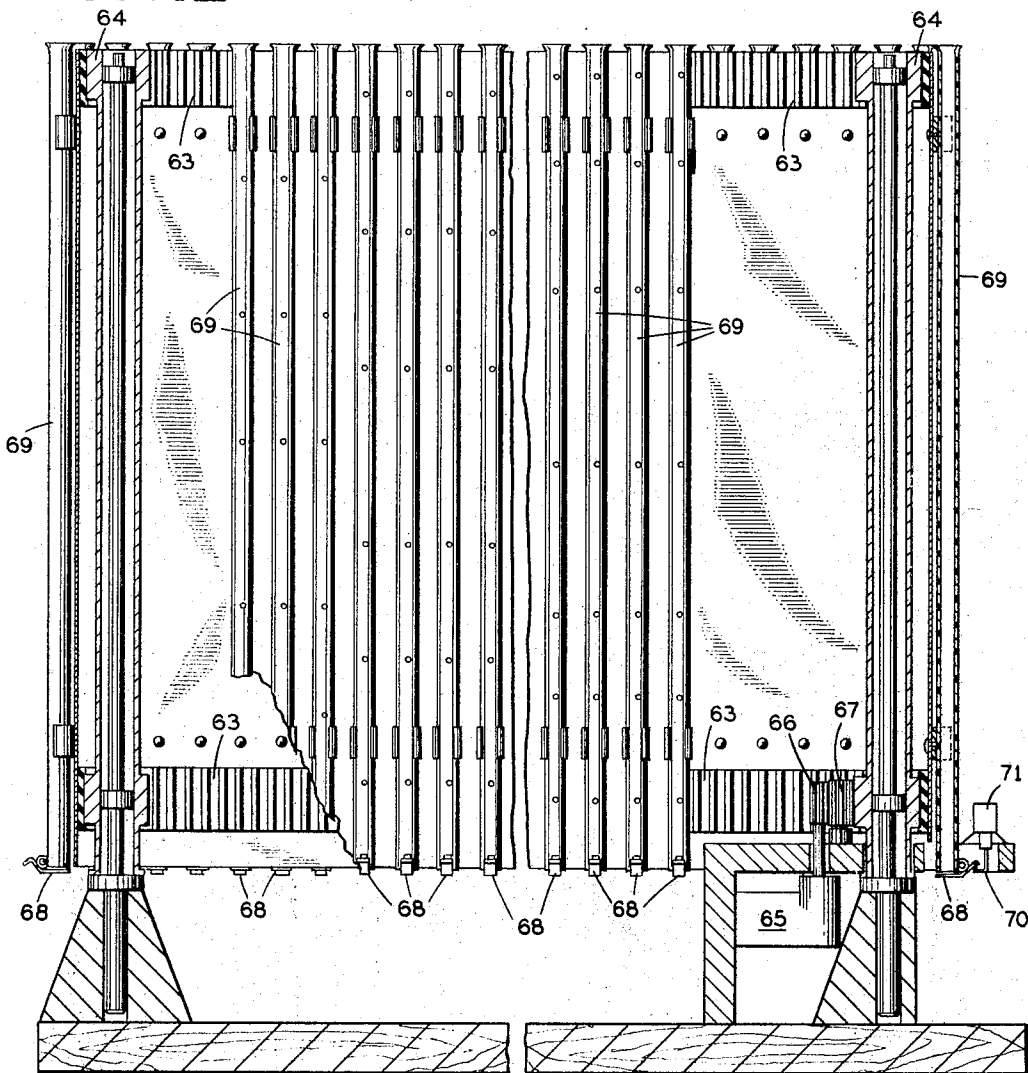


FIG. 13

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**ARTICLE DISPENSER WITH ROTATABLY MOUNTED MAGAZINES**

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Filed May 26, 1965, Ser. No. 458,868  
6 Claims. (Cl. 221—120)

This invention relates in general to semi-automatic dispensing machines and more particularly to a machine for selectively dispensing predetermined pluralities of a predetermined number of like bodies from a number of selections of different sizes and shape, such as pills, tablets, and capsules used by the medical profession.

Prior to this invention, small bodies such as pills, tablets and capsules were dispensed for use by manual count or by weight, which methods are inaccurate, time consuming and in many instances wasteful of the products.

The present invention overcomes the above objections and disadvantages by the provision of a manually operated selective machine in which a relatively large number of like bodies, such as pills, tablets or capsules of different size and shape, are loaded in separate magazines and by simple manual selective manipulation various quantities of each type may be quickly selected and dispensed by gravity into a container by pre-setting an exact counting means, which features are principal objects of the invention.

Another object of the invention is the provision of a rotary dispensing device for retaining a large plurality of selectively separated different types of bodies including a means for selectively registering and dispensing a predetermined number of each different type.

Another object of the invention is the provision of an electro-mechanical rotary dispensing device including a plurality of vertical magazines for holding quantities of different types of small bodies in separate vertical columns for selective electric controlled gravity dispensing.

Another object of the invention is the provision of a selective dispensing device for retaining predetermined pluralities of different small bodies in separate vertical magazines with electric means for selectively registering each of said magazines at dispensing position including an electro-mechanical dispensing means for the gravity release of a predetermined number of bodies from each said magazine when registered.

These and other objects and advantages in two embodiments of the invention are shown and described in the following specification and drawings, in which:

FIG. 1 is a side elevation of a preferred form of the dispensing device in reduced scale.

FIG. 2 is a top plan view thereof.

FIG. 3 is an enlarged cross sectional plan view taken through section line 3—3, FIG. 1.

FIG. 4 is an enlarged cross sectional plan view taken through section line 4—4, FIG. 1.

FIG. 5 is an enlarged fragmentary cross sectional view taken through section line 5—5, FIG. 1.

FIG. 6 is an enlarged cross sectional plan view taken through section line 6—6, FIG. 1.

FIG. 7 is an enlarged cross sectional plan view taken through section line 7—7, FIG. 1.

FIG. 8 is a fragmentary enlarged cross sectional plan view taken through section line 8—8, FIG. 1.

FIG. 9 is a schematic electric circuit diagram of the dispenser.

FIG. 10 is a fragmentary elevation of an alternate magazine element.

FIG. 11 is a cross sectional view taken through section line 11—11, FIG. 10.

FIGS. 12 and 13 illustrate fragmentary plan and side

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elevations, respectively, of an alternate form of dispenser in reduced scale.

Referring to FIGS. 1 and 2, the dispenser is mounted on a base 1 on which is journalled a magazine assembly 2 for rotation about a vertical axis *a*. A selector drum 3 is positioned coaxial with the magazine assembly and is adapted to rotate therewith. A push button assembly 4 is positioned on base 1, adjacent drum 3. A gear motor 5 is secured in base 1 for selectively rotating the magazine assembly 2 when periodically energized, better shown in FIG. 5.

The magazine assembly includes a lower disc 6 and an upper disc 7 which are adapted to rotate together by construction hereinafter described. In this particular embodiment, six tubular vertical magazines 8—8, 9—9, 10 and 11 have the same outside diameter but bores of different dimensions therethrough.

Each of the magazines is intended to be made from substantially transparent plastic material, such as polystyrene, with conical upper ends 12 to facilitate the loading of bodies by manual or an automatic feed means, not shown. Each magazine is quick detachable and retained on the dispenser by engagement of the lower end in a pocket in disc 6 and by its upper end in a resilient clip 13, thus each magazine may be removed and replaced by simple manual manipulation, better shown in FIG. 3.

Referring to FIGS. 1, 4 and 5, the magazine assembly shown in FIG. 1 is supported by a fixed vertical tube 14, of dielectric material, coaxially secured to a lower tube 15 by screw means 16. The lower end of tube 15 is secured in a bore in base 1 against a shoulder 17.

The upper disc 7 is centrally retained in the inner race 18 of a ball bearing and the outer race 19 of the bearing is fitted to the inside periphery of tube 14 against a stop ring 20, as shown. The lower disc 6, which contains the six equi-distant pockets for the magazines, is journalled for rotation about the outside periphery of tube 14 and each of the six pockets 20 for holding the magazines have a coaxial bore therethrough for the free gravity descent of each body therethrough.

An internal ring gear 22 is secured to the outside periphery of disc 6, as shown, for engagement by a pinion 23, which is driven by gear motor 5, which motor is mounted in a way means 24 in base 1 with a spring 25 normally holding the pinion 23 in mesh with ring gear 22. The drum 3 is integral with the ring gear 22 and extends downward around tube 15 with predetermined clearance therebetween. The ring gear also has bores 26 therein which coincide and are coaxial with bores 21 in disc 6.

Referring to FIG. 6, the upper side of ring gear 22 is provided with six shutters 27 of magnetic material with each having an upturned portion for attraction by an electro-magnet. Each shutter is pivoted for oscillatory movement about a vertical stud 28 and normally retained, as shown in full lines, by spring 29 anchored in gear 22 and normally holding each shutter 27 against a stop pin 30 with the outer end thereof normally intersecting the junction of bores 21 and 26, which position will hold all bodies in each magazine against gravity in the position shown in FIG. 5. It is now apparent that when the gear motor 5 is energized, the magazine assembly 2 will rotate about its principal axis *a* shown in FIG. 2 and rotate the magazines and the bodies therein with the lower end of each body resting upon a corresponding shutter 27. Selectivity is accomplished by rotating the desired magazine to a position over a dispensing zone on base 1 for holding a receptacle *c* for receiving the dispensed bodies, shown in FIGS. 1 and 5.

Referring to FIGS. 5 and 6, an electro-magnet 31 is secured within tube 15 by screw and bracket means 32 with the core 33 thereof extending laterally through a

clearance aperture in tube 15, as shown. It is now apparent that each upturned portion of each shutter 27, when selectively registered with core 33, will be attracted thereby when electro-magnet 31 is energized and will move to the position shown in dotted lines against the restraining action of spring 29.

Referring to FIG. 1, each magazine is provided with a plurality of transverse holes 34 therethrough in spaced relation in accordance with the length of a predetermined number of bodies retained in the magazine between the holes. However, certain magazines to be hereinafter described will include a plurality of transverse elongated apertures therethrough instead of holes 34.

Referring to FIG. 4, an electric conducting pin 35 is pointed at its outer end and provided with a knob 36 at its opposite end. This pin may be freely and selectively inserted through any one of the holes 34 in any one of the magazines, the outer end of which will engage a pair of longitudinal spring contacts 37—37, which are secured to the outer surface of the central tube 14, when a particular magazine is registered over the dispensing zone and with the contacts 37. It is apparent that the tube 14 can be made of metal with the elongated contacts 37 insulated therefrom.

Referring to FIG. 5, under the assumption that the pin 35 is inserted in the lowermost hole, shown in FIG. 1, then the six lowermost tablets will descend through bores 21 and 26 by gravity when the shutter 27 is displaced by magnet 31, thus permitting the tablets to descend into a receptacle *c*, illustrated resting on the base 1, placed in the dispensing zone.

The push button assembly 4 for the selective rotation of the magazines requires an individual button corresponding with each magazine, the construction of which is illustrated in FIG. 8, wherein a dielectric member 38 is secured to base 1 adjacent the drum 3, as shown in FIG. 1, with six superposed cylindrical plungers 39, each having a dielectric button 40 on the outer end thereof for bearing identification notation corresponding with each magazine. A conducting sleeve 41 is positioned in each bore connected to a vertical electric conductor 42, common to all six sleeves, by screw means 42s, as shown in FIG. 8. A separate detent means 43 corresponding to each plunger is provided in member 38 for holding the button in each of its two positions, as indicated in dotted lines, and each plunger has a detent means 44 in the outer end thereof for engaging a corresponding electric drum contact 45. The contacts 45 are arranged in equi-spaced helical relation on drum 3 whereby each plunger, when depressed, will engage a contact 45 corresponding with a selected magazine when registered with the dispensing zone. It is to be noted that the detent 44 will not only electrically engage its corresponding contact but the shape of the latter will serve a detent action to assure accurate registration of a selected magazine with the dispensing zone.

Referring to FIG. 5, a brush 46 is secured to base 1 for contact with drum 3, providing for an electric circuit between the contacts 45 and each plunger 39.

Referring to FIG. 9, a stepdown transformer  $T_1$  provides a safe low voltage for operating the dispenser, the primary of which is connected to a source of electric power  $L_1$  and  $L_2$  through a single pole, single throw switch 47.

A terminal of the secondary of transformer  $T_1$  is connected to one terminal of electro-magnet 31 by conductor 48. The remaining terminal of electro-magnet 31 is connected to one of the pair of terminals 37 by conductor 55. The remaining terminal of the secondary of transformer  $T_1$  is connected to the remaining contact 37 by conductor 53, which circuit is completed by the selected position of the pin 35 in each magazine.

When the rotor is desired to be electrically driven, the typical circuit for the selector elements previously described is also shown in FIG. 9, in which the common conductor 42 connected to all plungers 39 is connected to conductor 48(a) and one terminal of motor 5 and one

terminal of latching relay 49, which relay includes a pair of normally closed switch blades 50—51. The blade 50 is connected to the remaining terminal of gear motor 5 by conductor 52 and blade 51 is connected to conductor 53 by a conductor 53a. The remaining terminal of relay 49 is connected to brush 46 by conductor 54 for completing a circuit through all contacts 45.

It is now apparent that when the relay 49 is in its released position, as shown, and a plunger 39 is depressed by its corresponding button and the switch 47 is closed, the drum 43 will rotate the magazine 2 until a contact 45 corresponding with the selected magazine will engage the depressed plunger 39 which will complete a circuit through the latching relay 39 and open its switch blades 50—51, thus de-energizing the gear motor 5 and stopping the rotation of the magazine assembly with the selected magazine in register with the aforesaid zone for discharge into receptacle *c*.

To discharge the desired number of bodies from the selected magazine, pin 35 is inserted into a selected hole or slot corresponding to the number of bodies desired, as illustrated in FIG. 5, and the pin will energize electro-magnet 31 and operate the corresponding shutter 27, and permit all bodies below the pin to be discharged through bores 21 and 26 into receptacle *c*. To re-cycle the machine, the switch 47 is then opened and the relay restored to its initial position by releasing the latch therein by well known means, not shown.

It is now apparent that a larger number of magazines may readily be added by merely increasing the size of certain of the elements described.

It is also apparent that in a simplified form of the dispenser the motor means for rotating the rotor may be omitted in favor of selective manual rotation, in which case any well known means of detent between rotor and base may be used in place of the helical electro-mechanical detent shown.

FIGS. 10 and 11 show an alternate form of magazine 56 with longitudinal apertures 57 along its length with a plurality of bridges 58 for reinforcement purposes. This form of magazine is anchored by a cylindrical lower portion in the same pocket in disc 6 as the previously described magazine, and the upper end is anchored to the disc 7 in the same manner as previously described in register with projections 59 integral with the body of the magazine. A slider 60, of tubular spring material with one side thereof open, is frictionally retained on the outer surface of the magazine and has an aperture therethrough forming a pointer 61 for registration with indices lines 72 marked along the length of the magazine, for indicating predetermined number of bodies therein. A hole 62 is provided adjacent the pointer for receiving pin 35, thus providing a more accurate and a wider range of selected quantities of bodies to be discharged than the multi-hole tubes previously described.

FIGS. 12 and 13 illustrate an alternate form of construction for a dispenser having a relatively large number of vertical magazines having a corresponding large number of selections of small bodies. Although the general principles employed are substantially the same as shown and described in the rotary dispenser, endless belt 63 of the positive tooth driven type are adapted to rotate about a pair of vertical axes *b*-*C* on appropriate sprockets 64, which are driven by a gear motor 65 and pinion 66 through an idler gear 67.

A shutter 68 is pivoted on the lower end of each magazine and normally positioned by spring means, not shown, to hold the bodies within each tube. An electro-magnet means 71 secured to the base and positioned above the dispensing zone is adapted to engage each said shutter means 68 and rotate same to a dispense position when energized. It is also apparent that the drum type of a selecting system previously described may readily be adapted for this type of belt operation by suitable transmission means.

It is also understood that certain other modifications in

the construction, utilizing the features above described, are intended to come within the scope of the appended claims.

Having described my invention, I claim:

1. A dispenser for small bodies comprising a means forming a base including a fixed vertical rotor support means,
  - a rotor means journalled for rotation on said support means about a vertical axis,
  - a plurality of elongated tubular magazines of like length secured in spaced radial relation around the periphery of said rotor means with the axes thereof parallel said rotor means axis with the lower ends thereof positioned in a common plane above a dispensing zone,
  - each of said magazines having a longitudinal bore therethrough of uniform cross section substantially equal to the cross section of the bodies to be retained therein in end to end relation for storage and gravity descent therefrom,
  - a shutter means positioned in said rotor means for movement from a normal position transverse and below the lower end of each said magazines for holding said bodies therein to a dispense position adjacent thereto for permitting the gravity descent of said bodies from each of said magazines when operated,
  - spring means biased between said rotor means and each said shutter means for urging the latter into said normal position,
  - a predetermined number of transverse holes through each of said magazines in predetermined spaced relation along the length thereof for slidably receiving a metering pin for intersecting the bore therein,
  - a pair of elongated electric contacts in uniform spaced vertical relation secured on said support means adjacent the path of rotation of the inner side of each of said magazines,
  - an electric conducting metering pin for manual insertion through a selected one of each said holes in each said magazine for bridging said pair of contacts and holding a predetermined number of said bodies above said pin in each of said magazines when each of said magazines is selectively rotated into register with said zone,
  - electro-magnetic means in said support adapted and constructed to move each of said shutter means from said normal to said dispense position when each of said magazines is rotated about said axis into register with said zone and said electro-magnetic means when the latter is energized,
  - a source of electric energy,
  - circuit means connecting said source of energy and said pair of contact means and said electro-magnetic means whereby the rotation of said rotor means will position a selected one of said magazines in register with said zone and the insertion of said pin in a selected hole in said selected magazine will energize said electro-magnetic means and permit the gravity descent into said zone a predetermined number of said bodies below said pin.
2. The construction recited in claim 1 with at least one of said magazines having a cylindrical bore for storing and gravity dispensing bodies of circular cross section in end to end linear relation with at least one of said magazines having a rectangular bore for storing and gravity dispensing substantially cylindrical bodies of rectangular cross section in edge to edge linear relation.
3. The construction recited in claim 1 including detent means cooperatively associated with said rotor and said base for holding each selected one of said magazines in register with said zone when moved thereto for dispensing said bodies therefrom.
4. A dispenser for small bodies comprising a means

- forming a base including a fixed vertical rotor support means,
  - a rotor journalled for rotation on said support means about a vertical axis,
  - a plurality of tubular magazines detachably secured in equi-spaced relation about the periphery of said rotor assembly with the axes thereof parallel the axis of said rotor,
  - each of said magazines having a uniform longitudinal bore therethrough with a uniform cross section thereof substantially equal to the cross section of the bodies to be retained therein in end to end relation for storage and gravity descent therefrom,
  - magnetically responsive shutter means positioned in said rotor under each of said magazines for movement from a normal position for holding said bodies in each of said magazines to a dispense position adjacent thereto for permitting the gravity descent of bodies from each of said magazines when magnetically operated,
  - spring means biased between said rotor assembly and said shutter means for normally urging the latter into said holding position,
  - electro-magnet means secured in said support means for operating each of said shutter means in register therewith when energized,
  - each of said magazines having central transverse openings through both sides thereof disposed in radial relation to said axis,
  - a pair of elongated electric contacts in fixed uniform spaced relation secured on said support means in close spaced relation adjacent the path of rotation of the inner sides of said magazines,
  - an electric conducting means for manual vertical selective positioning through a selected one of said apertures for bridging said pair of contacts and holding said bodies above said conducting means in each of said magazines when each of the latter is selectively rotated into register with said contacts,
  - a source of electric energy,
  - circuit means connecting said source of energy and said contact means and said electro-magnet means whereby the rotation of said rotor about said-axis will position a selected one of said magazines in register with said contacts and the selective positioning of said conducting means through a selected one of said apertures along said magazines and the selective movement said conducting means through a selected said one of aperture will energize said electro-magnet means and operate a said shutter means corresponding with said magazine and permit the gravity descent and dispensing of a predetermined number of said bodies positioned below said conducting means.
5. In a dispenser of the character described a means forming a base,
  - a rotor means journalled on said base for rotation thereon about a vertical axis,
  - a tubular magazine secured on the periphery of said rotor means with the axis thereof parallel said rotor axis,
  - said magazine having a bore therethrough of predetermined cross section for storing a plurality of bodies in end to end relation when held therein against the action of gravity,
  - said magazine having longitudinal openings therethrough central along the length thereof,
  - a pair of elongated electric contacts in spaced vertical relation secured on said base and parallel said vertical axis positioned adjacent the path of rotation of the inner side of said magazine,
  - a release means movably secured on said rotor means normally holding said bodies in said magazine against the action of gravity and for releasing said bodies to

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descent from said magazine when moved to a release position,  
 an electric conducting pin means adapted and constructed for selected position through said openings for holding said bodies thereabove in said magazine and bridging said contacts,  
 electro-magnetic means operatively associated with said release means for moving same to said release position when energized,  
 a source of electric energy,  
 a circuit means connecting a said source of energy and said magnetic means and said contacts whereby the said bodies below said pin means in said magazine will descend by gravity from said magazine when said magnetic means is energized by the closing of said circuit means by said pin means.  
 6. In a dispenser of the character described a means forming a base,  
 a rotor journaled on said base for rotation thereon about a vertical axis,  
 a plurality of tubular magazines secured in spaced relation around the outer periphery of said rotor with the axes thereof parallel said rotor axis,  
 each of said magazines having a bore therethrough for storing a plurality of bodies in end to end formation when held therein against the action of gravity,  
 independent holding means positioned on said rotor at the lower end of each of said magazines for normally holding said bodies therein and releasing same to descend by gravity when operated,  
 a dispensing zone in said base below the path of rotation of said magazines for receiving said bodies from

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a selected one of said magazines when the latter is rotated to a dispense position over said zone and said corresponding said holding means is operated,  
 an electric motor with a transmission therefor on said base connected to said rotor for selectively rotating the latter when the motor is selectively energized,  
 means forming an electric commutator on said base for rotation with said rotor,  
 said commutator means including a plurality of manually operable push buttons with each one thereof corresponding to each one of said magazines,  
 a source of electric energy,  
 circuit means connecting said source of energy and said commutator means and said push buttons and said motor whereby the operation of any one of said push buttons will rotate said rotor and register a corresponding said magazine with said zone.

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