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[54] **MEDICINE DISPENSING APPARATUS**
 18 Claims, 14 Drawing Figs.

[52] U.S. Cl. 221/2,
 221/124, 221/154, 221/209
 [51] Int. Cl. G07f 7/02
 [50] Field of Search 221/2, 4, 6,
 5, 18, 94, 127, 124, 154, 187, 190, 209, 242

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ABSTRACT: A medicine dispensing apparatus is mounted in a cabinet having a medicine receiving hopper therein. A plurality of medicine dispensing housings are mounted in the cabinet with each communicating with the hopper. A magazine containing medicine in the form of a plurality of pills, capsules, tablets, ampuls and the like is movably mounted within each housing and a reciprocable plunger is engaged by each magazine. Plunger moving means are mounted within the cabinet and are selectively engaged and activated for moving the respective magazine from a medicine retaining position to a medicine dispensing position and return. Interaction of an interposer slidably mounted in each housing, an inclined slide surface in a medicine containing chamber within each magazine, and a slidable door permit ejection of a single unit of medicine such as a pill, capsule, tablet, ampul or the like from the respective magazine for each movement of the respective magazine to the medicine dispensing position.

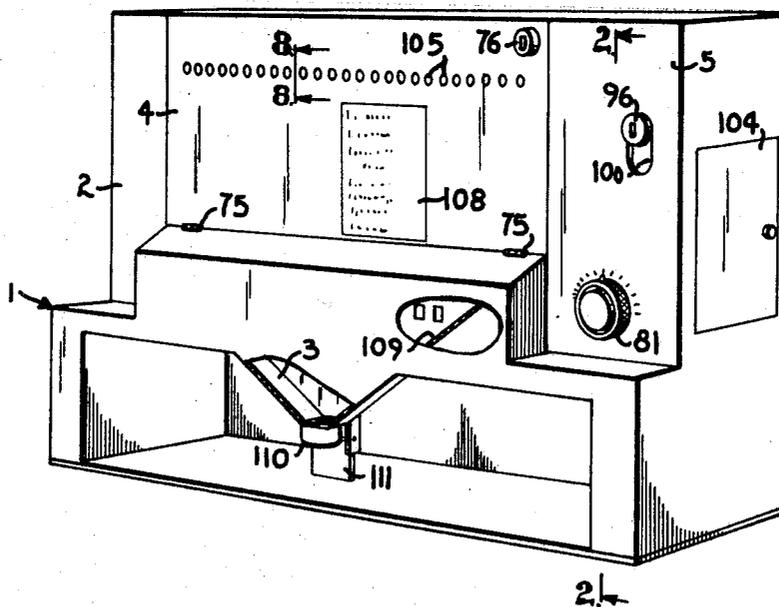


Fig. 1.

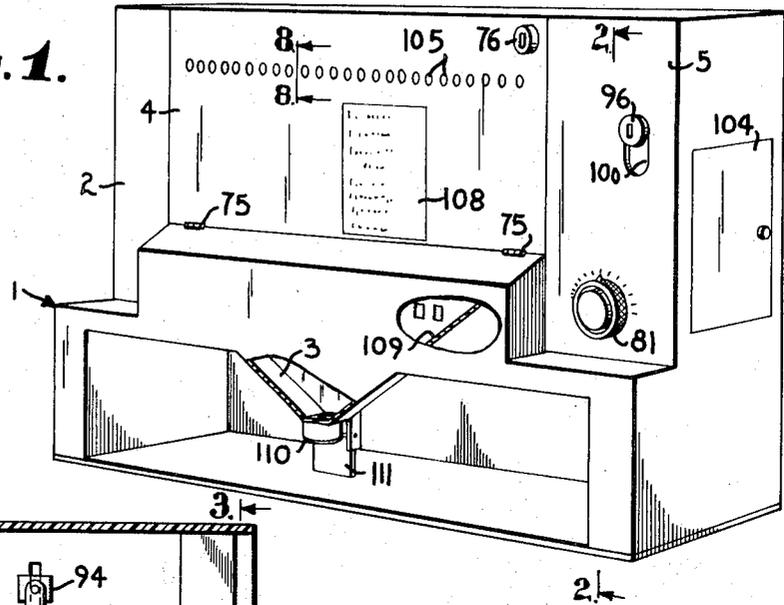


Fig. 2.

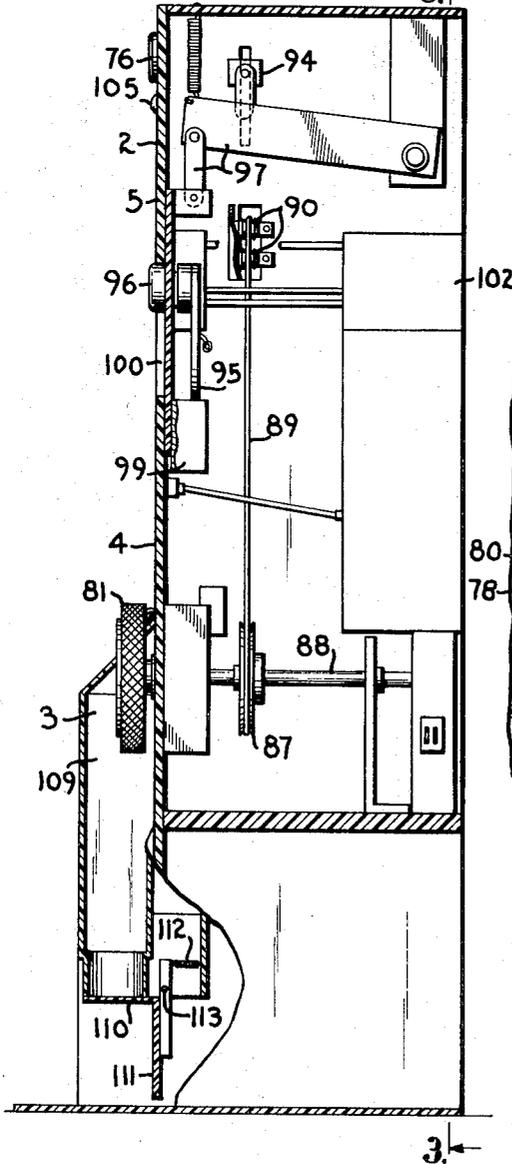
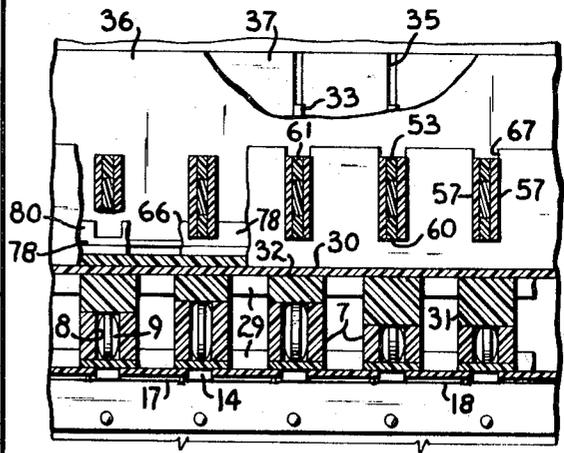


Fig. 6.



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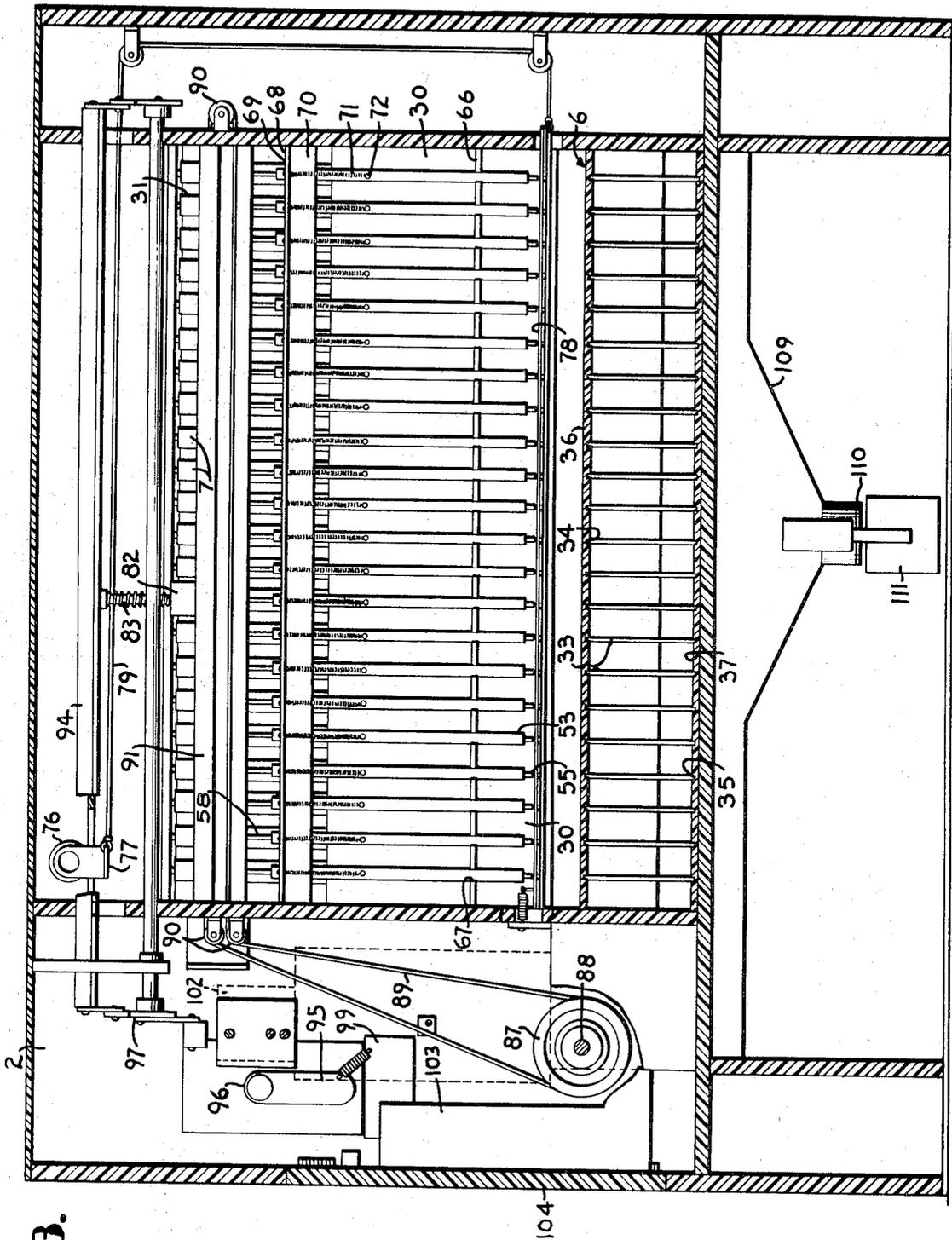


Fig. 3.

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Fig. 4.

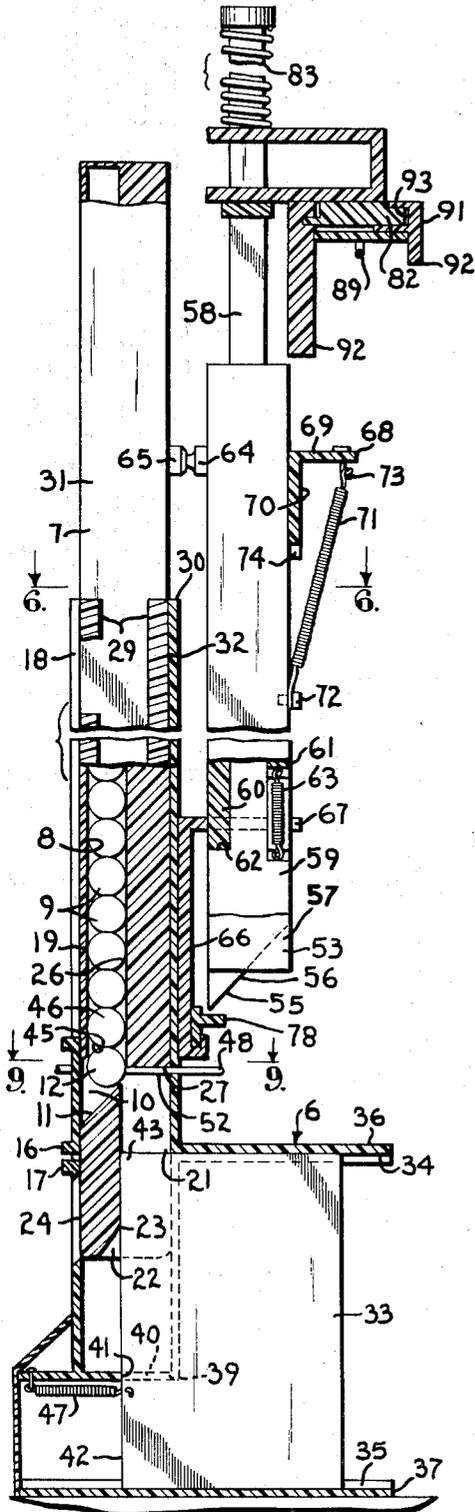


Fig. 5.

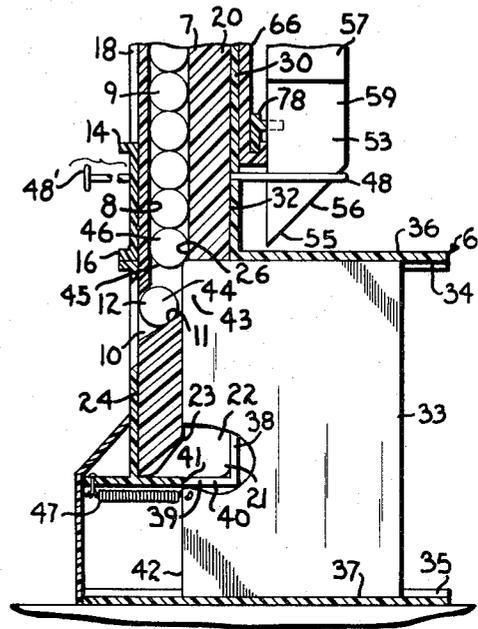
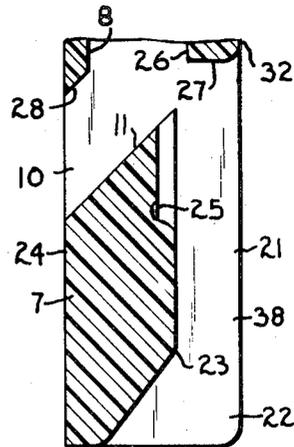


Fig. 7.



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Fig. 8.

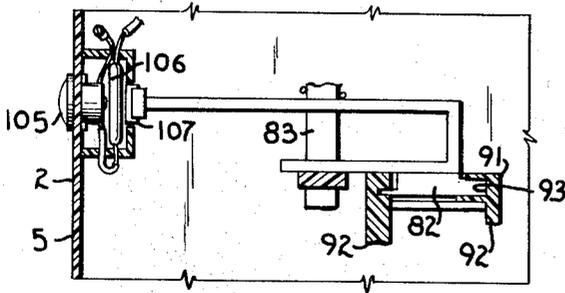


Fig. 11.

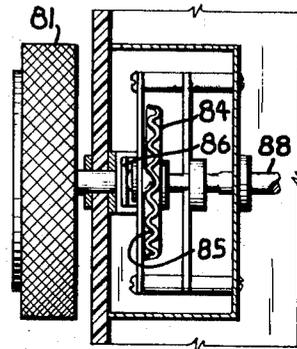


Fig. 9.

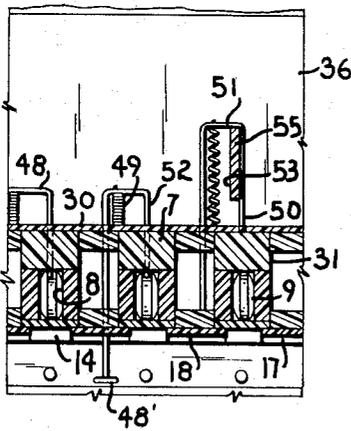


Fig. 10.

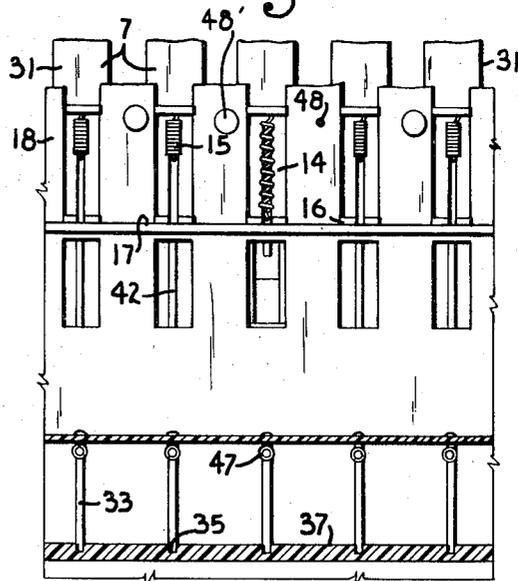
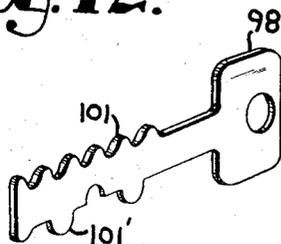


Fig. 12.



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Fig. 13.

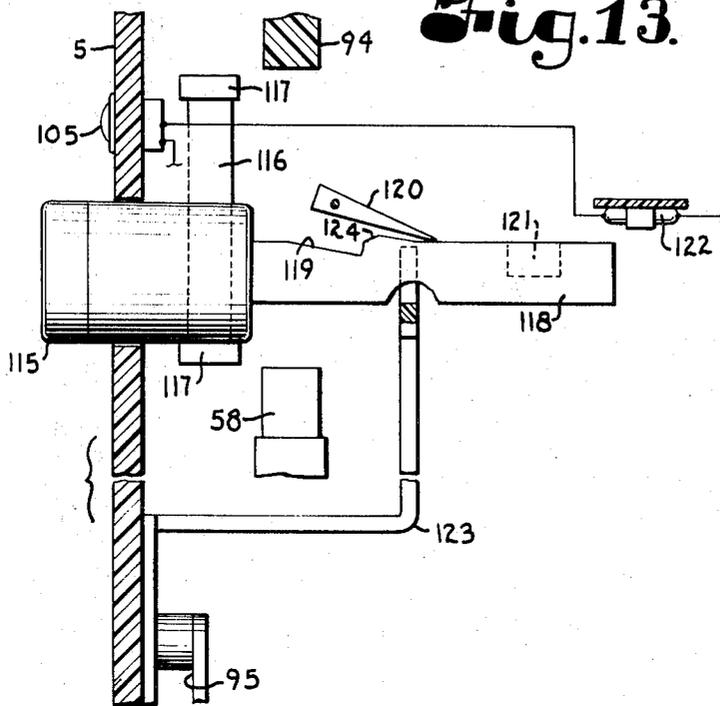
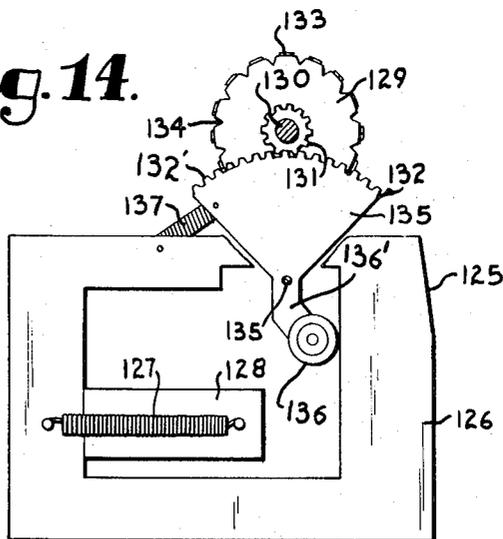


Fig. 14.



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MEDICINE DISPENSING APPARATUS

This invention relates to medicine dispensing apparatus for dispensing single units of medicine such as pills, capsules, tablets, ampuls and the like and more particularly to a medicine dispenser containing a plurality of varieties of medicines.

Heretofore, medicine, such as narcotics, drugs, capsules, tablets, pills and the like were shipped to using agencies, such as hospitals, in containers, such as bottles, jars and the like which must be opened to dispense the contents. In hospitals a person in charge, such as a floor head nurse, obtained a desired container of medicine from a central pharmacy and dispensed the desired medicine to a nurse under her supervision who administered same to the patient. The pharmacy must record the head nurse receiving the medicine, type of medicine, amount, time, and other information necessary to control sensitive medicine. The head nurse must sign for the container and then must record the nurse receiving the medicine, amount delivered, and patient to receive the medicine thereby resulting in the medicine being handled many times with many time consuming records being manually maintained by the hospital, pharmacy, and head nurse respectively.

The principal objects of the present invention are: to provide medicine dispensing apparatus for selectively dispensing a single unit of medicine such as an ampul, pill, capsule, tablet, or the like from one of a plurality of medicine containing magazines; to provide such a medicine dispensing apparatus adapted to selectively dispense a single unit of medicine from magazines containing one of a plurality of types of medicine and shapes of pills, capsules, tablets, ampuls and the like; to provide a plurality of closed magazines each containing a plurality of units of one type of medicine installed therein without human contact with the units of medicine; to provide such a medicine dispensing apparatus adapted to receive a plurality of such magazines and selectively dispense a single unit of medicine such as a pill, capsule, tablet, ampul, or the like into a hopper all without human contact with the medicine; to provide such a medicine dispensing apparatus having inventory control means for recording information, such as type of medicine dispensed, time dispensed, code designation of person receiving the medicine, number of each type dispensed, and the like; to provide such a medicine dispensing apparatus adapted to sense empty magazines; to provide such medicine dispensing apparatus having indicating means for indicating the particular magazine from which the unit of medicine is to be dispensed; and to provide such medicine dispensing apparatus and magazines therefor which are simple to operate, economical to manufacture, accurate and dependable in operation, and efficient and durable in use.

Other objects and advantages of this invention will be become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a perspective view of medicine dispensing apparatus in a cabinet embodying features of the present invention.

FIG. 2 is a transverse sectional view through the cabinet taken on line 2-2, FIG. 1.

FIG. 3 is a longitudinal sectional view through the cabinet taken on line 3-3, FIG. 2.

FIG. 4 is a fragmentary sectional view showing details of the medicine dispensing device and the associated magazine and plunger in a medicine retaining position.

FIG. 5 is a fragmentary sectional view similar to FIG. 4 except showing the magazine and plunger in a medicine dispensing position.

FIG. 6 is a fragmentary horizontal sectional view taken on line 6-6, FIG. 4.

FIG. 7 is an enlarged fragmentary sectional view of the dispensing end of the magazine.

FIG. 8 is a fragmentary sectional view of magazine indicating means taken on line 8-8, FIG. 1.

FIG. 9 is a fragmentary horizontal sectional view taken on line 9-9, FIG. 4.

FIG. 10 is a fragmentary front elevational view of the medicine dispensing device showing the magazine door.

FIG. 11 is an enlarged detail of the selector with portions shown in section to better illustrate the parts thereof.

FIG. 12 is a perspective view of a double edge key for operation of the recording device and the selected plunger.

FIG. 13 is an enlarged fragmentary sectional view of a modified magazine indicating means.

FIG. 14 is an enlarged fragmentary elevational view of one slide for a key printer for recording a selection of a magazine.

Referring more in detail to the drawings:

The reference numeral 1 generally designates a medicine dispensing apparatus mounted in a cabinet 2 having a medicine receiving hopper 3 therein. A front door 4 is mounted on the cabinet 2 at a cabinet front 5 to provide access to a plurality of medicine dispensing devices 6. A medicine containing magazine 7 is movably mounted within each of the medicine dispensing devices 6.

Each of the medicine containing magazines 7 has an elongated closed medicine chamber 8 containing a plurality of units 9 of medicine in the form of pills, capsules, tablets, ampuls, and the like. An exit 10 is positioned at one end of the medicine chamber 8. The exit 10 is sized to permit a single unit 9 of medicine to pass out of the medicine chamber 8. Adjacent the exit 10 and at the exit end of the medicine chamber 8 there is an outwardly and downwardly inclined slide surface 11 positioned to be engaged by a first unit 12 of medicine and to guide the first unit 12 outwardly through the exit 10.

It is desirable to maintain the units 9 of medicine within the magazine 7 during shipment of the magazine and during installation thereof in the respective medicine dispensing device 6 and removal therefrom. It is also desirable to retain the units 9 of medicine within the magazine 7 should same be removed from the respective medicine dispensing device 6 before being emptied. Therefore, in the illustrated structure, a slidable spring loaded magazine door 14 is normally maintained in a position closing the exit 10 by a suitable resilient member, such as a tension spring 15. An abutment member 16 is mounted on the magazine door 14 and is positioned to engage an upper edge 17 of a front wall 18 of the respective medicine dispensing device 6, as later described, during travel of the respective magazine 7 from a medicine retaining position 19 as shown in FIG. 4 toward a medicine dispensing position 20 as shown in FIG. 5 thereby opening the magazine door 14 by overcoming the resistance of the spring 15.

A way or guide 21 in the form of an elongate slot is positioned at a lower end 22 of each of the magazines 7. A cam surface 23 is curved upwardly and inwardly from the lower end 22 adjacent a magazine front 24. The cam surface 23 terminates at a substantially straight and upwardly directed guide surface 25 which intersects the slide surface 11 at a point spaced from a back wall 26 of the medicine chamber 8 a distance equal to the thickness of the slidable magazine door 14. The way or guide 21 ends at a point 27 positioned above a top surface 28 of the exit 10.

In the illustrated structure, the slide surface 11 is beveled downwardly and outwardly toward the exit 10 whereby the first unit 12 of the units 9 of medicine engages the slide surface 11 and is disposed toward the exit 10. The medicine chamber 8 in the magazine 7 is internally shaped to align the remainder of the units 9 of medicine therein. The top surface 28 of the exit 10 is beveled downwardly and outwardly substantially parallel with the slide surface 11 thereby cooperating with the slide surface 11 for ejection of the first unit 12 when the magazine door 14 is open.

The medicine dispensing device 6 has a plurality of guide members 29 adjacent the front wall 18 and a backwall 30. The guide members 29 are spaced to slidably engage sides 31 of the respective magazine 7 positioned therebetween. The backwall 30 of the medicine dispensing device 6 is also positioned to slidably engage a rear face 32 of the respective magazine 7.

An interposer 33 is movably mounted in upper and lower guide grooves 34 and 35 respectively. The upper and lower guide grooves 34 and 35 are positioned in upper and lower walls 36 and 37 respectively.

The interposer 33 is movable through a slot 38 in the backwall 30 and a slot 39 in an intermediate wall 40. In the illustrated structure, the intermediate wall 40 is positioned between the upper wall 36 and the lower wall 37 and is positioned to be engaged by the lower end 22 of the magazine 7 when the respective magazine 7 is in the medicine dispensing position 20 thereby closing the space between the guide members 29.

The slot 39 in the intermediate wall 40 ends at a point 41 which positions a leading edge 42 of the interposer 33 in spaced relation with the front wall 18. The leading edge 42 is thereby positioned to be engaged by the cam surface 23 and moved toward the backwall 30 while the respective magazine 7 is being moved toward the medicine dispensing position 20. The guide surface 25 positions an upper corner 43 of the interposer 33 within the medicine chamber 8 whereby the upper corner 43 engages a side surface 44 of the first unit 12 and thereby urges same outwardly through the exit 10. The upper corner 43 is positioned to be engaged by a bottom surface 45 of the next or second unit 46 thereby supporting the remainder of the units 9 in their aligned relation within the medicine chamber 8 of the respective magazine 7. In the illustrated structure, the next or second unit 46 of medicine is positioned above the downwardly and outwardly sloped top surface 28 of the exit 10 when engaged by the interposer 33.

In the illustrated structure, a suitable resilient member, such as a helical tension spring 47 is operative to urge the leading edge 42 toward the point 41. One end of the spring 47 is secured to the leading edge 42 and an opposite or other end of the spring 47 is suitably secured to a forward portion of the intermediate wall 40.

A magazine supporting member 48 is positioned to engage the end 27 of the way 21 thereby supporting the magazine 7 in the medicine retaining position 19. A suitable resilient member, such as a tension spring 49 is positioned to bias or urge one end 50 of the magazine supporting member 48 into the medicine chamber 8.

In the illustrated structure, one end of the spring 49 is secured to a cam follower portion 51 of the magazine supporting member 48 which is parallel with the backwall 30 of the medicine dispensing devices 6. The other end of the spring 49 is secured to the backwall 30 of the magazine supporting member 48.

The spring 49 urges the one end 50 to a position to be engaged by the cam surface 23 when the respective magazine 7 is inserted between the guide walls 29. The one end 50 engages the guide surface 25 of the way or guide 21 as the respective magazine 7 is inserted between the guide walls 29. The spring 49 urges the one end 50 of the magazine supporting member 48 into contact with the side surface 44 of the first unit 12 of medicine.

When the one end 50 of the magazine supporting member 48 engages the side surface 44 of the medicine, an abutment portion 52 of the magazine supporting member 48 is positioned to engage the end 27 of the way 21 thereby supporting the respective magazine 7. When the medicine chamber 8 is empty, the spring 49 urges the one end 50 into the chamber 8 thereby preventing the magazine 7 being moved up or down within the medicine dispensing device 6.

When it is desired to remove an empty magazine 7 and replace same with a full magazine 7, the door 4 is opened and an enlarged portion or button 48' on an exposed end of the magazine supporting member 48 is moved toward the abutment member 16 to move the one end 50 of the abutment portion 52 out of the way of guide 21 whereby the empty magazine 7 may be removed.

A plunger 53 is operative to engage the cam follower portion 51 and urge same outwardly from the backwall 30 until the one end 50 is disengaged from the end 27 of the way or guide 21, thereby permitting the respective magazine 7 to

travel to the medicine dispensing position 20. The end 27 of the way or guide 21 may be curved upwardly similar to the cam surface 23 adjacent the rear face 32 of the magazine 7 to assist the plunger 53 in disengaging the one end 50 from the respective magazine 7.

When the medicine chamber 8 is empty the spring 49 urges the cam follower portion 51 toward the backwall 30 thereby positioning the cam follower portion 51 to be cleared by the plunger 53 thereby retaining the empty magazine 7 in a position supported by the magazine supporting member 48 and preventing the activation of recording equipment, as later described.

In the illustrated structure the plunger 53 includes a blade member 55 having a cam surface 56 on one end thereof. The cam surface 56 is shaped to engage the cam follower portion 51 of the magazine supporting member 48 during downwardly movement of the blade member 55. In the illustrated structure, the blade member 55 is sandwiched between side plates 57. A stem portion 58 of the blade 55 has a lateral dimension less than the dimension of the side plates 57 and less than the lateral dimension of a cam portion 59. Filler bars 60 and 61 are positioned between the plates 57 on opposite sides of the stem portion 58. One of the filler bars, for example bar 60, is positioned to have one end engage a shoulder 62 formed by the connection or junction of the stem portion 58 to the cam portion 59. A suitable resilient member, such as a tension spring 63 is operative to urge the shoulder 62 into engagement with said one end of the bar 60. In the illustrated structure, the spring has one end secured to the cam portion 59 and the other end secured to the other filler bar 61.

The magazine 7 engages and is attached to a respective plunger 53 upon being inserted in the medicine dispensing device 6. In the illustrated structure, a suitable male plug 64 is mounted on the plunger 53 and positioned to be engaged in a suitable female receptacle 65 in the magazine 7.

A plunger guide member 66 engages the back wall 30 immediately above the cam follower portion 51 and extends between opposite sides of the cabinet 2. A plurality of slots or notches 67 are longitudinally spaced along one edge of the guide member 66 to guide respective plungers 53. A plunger support member 68 is positioned in spaced relation with the backwall 30 and extends between opposite sides of the cabinet 2. The plunger support member 68 is illustrated as an L-shaped member having an outstanding leg or flange 69 and a depending leg or flange 70.

A suitable resilient member, such as a tension spring 71, is operative to urge the plunger 53 upwardly from the magazine supporting member 48. In the illustrated structure, one end of the spring 71 is secured to a lower projection 72 extending outwardly from the plunger 53 intermediate its ends and the other end is secured to a suitable keeper 73 mounted in the outstanding leg or flange 69. The spring 71 is also operative to urge an upper projection 74 into abutting engagement with the depending leg or flange 70 thereby limiting the upward movement of the plunger 53 and positioning same to be engaged and moved with the magazine 7 to the dispensing position 20.

The cabinet front door 4 is mounted on hinges 75 positioned adjacent the medicine receiving hopper 3. A lock 76 is mounted in the cabinet 2 and has a keeper 77 adapted to engage one edge of the front door 4. In the illustrated structure, the front door 4 opens outwardly and downwardly from the cabinet 2 to provide access to the medicine dispensing devices 6 and to permit installation of the magazine 7 between the respective guide walls 29.

A slidable safety member 78 is mounted in the plunger guide member 66 and is connected to the keeper 77 by a suitable cable and pulley connection 79, as best shown in FIG. 3. The cam portion 59 of respective plungers 53 may move between spaced projections 80 extending outwardly from the safety member 78 when the front door 4 is closed and the keeper 77 is in the locked position. The linkage 79 is connected to the keeper 77 and is operative to move the safety

member 78 within the plunger guide member 66. When the keeper 77 is moved to an unlocked position, the projections 80 are positioned in an aligned relation with each of the cam portions 59 of the respective plungers 53 thereby preventing dispensing of medicine when the front door 4 is open or the keeper 77 is in an unlocked position.

A suitable selector knob 81 is mounted on the cabinet front 5 and suitably positioned for a person to operate same to select a desired medicine in one of the plurality of magazines 7. The selector knob 81 is operatively connected to a carriage 82 having a rod 83 resiliently mounted therein and positioned to engage a selected stem portion 58 of a respective plunger 53 for moving the respective magazine 7 to its medicine dispensing position 20.

In the illustrated structure, the selector knob 81 positions a wheel 84 having a plurality of circumferentially spaced recesses 85 to receive and retain a suitable ball resiliently supported by a suitable leaf spring 86. Each of the recesses 85 is associated with a selected position of the carriage 82 for moving a selected magazine 7 to its medicine dispensing position 20. The number of recesses 85 in the wheel 84 corresponds with the number of magazines 7 however, an additional series of magazines 7 may be mounted in the cabinet 2 and selected by additional rotation of the wheel 84 with each of the recesses 85 associated with one of the magazines 7 in each series of the magazines.

A circular wheel or disc 87 is mounted on a shaft 88 which also supports the selector knob 81 and the wheel 84. A suitable flexible connecting member, such as a cable 89, is wound around the periphery of the wheel or disc 87 and is connected to the carriage 82. The number of turns of the cable 89 around the disc 87 corresponds to the number of series of magazines 7. Suitable idler pulleys 90 are positioned within the cabinet 2 to guide the carriage 82 in its travel to the respective selected positions.

In the illustrated structure the carriage 82 is movable along a track 91 formed by opposed rail members 92 each having suitable grooves or recesses 93 therein for receiving corresponding parts of the carriage 82.

An elongate bar 94 is positioned to engage the rod 83 and to move same thereby moving the selected magazine 7 to its medicine dispensing position 20. In the illustrated structure, the elongate bar 94 is operatively connected to a lever or keeper 95 of a suitable lock 96 which is connected to a suitable linkage 97.

One of a plurality of keys 98 is inserted in the lock 96 and turned through an angle of at least 90° to disengage the lever or keeper 95 from an abutment member 99 and turn the lever or keeper 95 also through an angle 90°. The lock 96 with the keeper 95 is now in a position to be moved along a way 100 in the cabinet front 5 and thereby move the elongate bar 94 by means of the linkage 97. Each time the lock is moved along the way 100 a single unit of medicine is dispensed from the selected magazine 7.

Each of the keys 98 has a plurality of projections 101 along one edge for unlocking the lock 96 and permitting the lever or keeper 95 to also be turned through the same 90° angle. The opposite edge of the keys 98 also has one or more projections 101' positioned therealong to serve as a representative code designation of the person having the respective key 98.

The keys 98 with the respective representative code designation are operative to activate a suitable recorder 102 during movement of the lock 96 along the way 100 and record the code designation of the person operating the medicine dispensing apparatus 1. The recorder 102 is operatively connected to the selector knob 81 thereby also recording the particular type of medicine dispensed. A suitable time clock 103 is also operatively connected to the recorder 102 thereby recording the precise time of the dispensing of the selected medicine.

A side door 104 provides access to the recorder 102. It is preferred that only selected key personnel, such as a head floor nurse in a hospital or a chief pharmacist or the like, hav-

ing access to the recorded information especially when the medicine dispensing apparatus 1 contains sensitive medicine, such as narcotics. The recorder 102 is also particularly adapted for inventory control information in that quantity of each type of medicine is recorded and may be used to reorder new magazines 7 containing the medicine supply exhausted.

A plurality of suitable indicators, such as light bulbs 105, are positioned to indicate the respective magazines 7 with which the rod 83 is aligned. In the illustrated structure, the bulbs 105 are mounted on the cabinet front 5 where a suitable switch such as an enclosed normally open switch 106 having one lead connected to the respective bulb 105 and the other lead connected to a suitable power source (not shown), such as a battery contained within the medicine dispensing apparatus 1 or a suitable electrical outlet. A suitable magnet 107 is mounted on the carriage 82 adjacent the line of switches 106 and is operative to close the normally open switch immediately adjacent the carriage 82 thereby completing the circuit to the respective bulb 105.

It is also preferable that a suitable table 108 be mounted on the cabinet 2, as for example on the front door 4 with the table 108 listing the contents of each of the magazines 7 thereby assisting a person in selecting the desired type of medicine.

In operation a person, such as a nurse, desiring a single unit of a certain type of medicine moves the selector knob 81 to align the rod 83 with the respective stem portion 58 of the respective plunger 53. The person then inserts their key 98 in the lock 96, turns the key 90° thereby disengaging the lever 95 from the abutment member 99, and moves the key 98 downwardly in the way 100 thereby dispensing a single unit of medicine from the selected magazine 7. The unit of medicine is ejected or discharged into the hopper 3 and moves by gravity into a chute 109 and comes to rest on a normally closed trap door 110. The person making the selection then takes a suitable receptacle or container, such as a paper or plastic cup (not shown), and places the receptacle or container against a lever 111 and moves same rearwardly overcoming the force of a suitable resilient member, such as tension spring 112, and removing the support for the trap door 110 thereby permitting the door 110 to open. In the illustrated structure, the lever 111 and the trap door 110 are pivotably mounted about pin 113; the selected unit of medicine thereby falling into the container from which a patient may take the medicine.

All of the medicine in the medicine dispensing apparatus 1 is protected from human contact or other contamination from the time the medicine is enclosed in the respective magazines 7 until dispensed through the chute 109 and trap door 110 into the container thereby removing a possible source of contamination to recipients of the dispensed medicine.

FIG. 13 illustrates a modified magazine selecting and indicating means wherein a plurality of pushbuttons 115 are mounted in the cabinet front 5 adjacent and aligned with a respective indicator bulb 105. A selection is made by moving a selected pushbutton 115 inwardly to position an interposer 116 under the elongate bar 94 and to align the interposer 116 with the stem portion 58 of the blade 55. The interposer 116 has an enlarged upper and lower end portions 117 with the upper end portion 117 positioned to be engaged by the elongate bar 94 upon operation of the lever or keeper 95 of the lock 96 to engage the lower end portion 117 with the stem portion 58 of the plunger 53 so as to move the selected magazine 7 to its medicine dispensing position 20.

It is desirable to maintain the pushbutton 115 in a depressed or inward position to indicate the last selection made and to be locked in said depressed or inward position wherein a bar 118 extends from each pushbutton 115 and the bar 118 has a locking notch 119 in an upper surface thereof to receive a pawl or lock bail 120. The pawl or lock bail 120 is positioned above the bar 118 and is spring loaded or biased to move into the locking notch 119 when the respective bar 118 is moved inwardly.

The bar 118 has a suitable magnet 121 mounted therein which is moved to a position adjacent a line of normally open

switches 122. Each switch 122 is aligned with a respective bar 118 and the magnet 121 therein is operative to close the respective normally open switch 122 aligned therewith thereby completing a circuit to the respective bulb 105. The switches 122 may be operatively connected to and activate other components, such as relays for printout information, such as the magazine selected and the like.

It is desirable to provide means for moving the pawl or locking bail 120 out of the locking notch 119 and to cancel the previous selection. FIG. 13 illustrates a linkage 123 which is operatively connected to a cancel button (not shown) thereby providing means to cancel an erroneous selection of a magazine 7, such as one not having the desired medicine therein. Each bar 118 has a slight cam rise 124 positioned adjacent the locking notch 119 therein and positioned to engage and raise the locking pawl or bail 120 when the respective bar 118 is moved inwardly by the pushbutton 115.

In use, the respective pushbutton 115 is pushed inwardly thereby moving the bar 118, to the right as shown in FIG. 13, and engaging the locking pawl or bail 120 with the cam rise 124 thereby positioning the notch 119 to receive the pawl 120 by the operation of the resilient member (not shown) biasing the lock pawl or bail 120 downwardly so as to move into the locking notch 119 of the bar 118 of the presently operated pushbutton 115.

The key 98 is placed in the lock 96 and turned to operate the lever or keeper 95 to move the bar 94, through operation of the linkage 97, to engage the upper portion 117 of the interposer 116 and move same downwardly to operate the plunger 53 to dispense the selected medicine.

FIG. 14 illustrates some of the components of the recorder 102 which is positioned adjacent the lock 96. The respective keys 98 are inserted into the lock 96 thereby operating the lever or keeper 95 wherein each of the projections 101' engage a respective contact surface 125 of one of a plurality of slides 126 mounted in suitable ways or guide grooves (not shown) to move same, to the left as shown in FIG. 14, against the resistance of a suitable resilient member, such as a spring 127. The spring 127 has one end mounted on the respective slide 126 and has the opposite end mounted on a limit block 128 positioned to limit the movement of the respective slide 126, to the right as shown in FIG. 14, within the recorder 102 and to position the respective contact surface 125 in a position to be engaged by the respective projection 101' of the keys 98.

A plurality of print wheels 129 are each rotatably mounted on an elongate shaft 130 and the print wheels 129 each have a gear 131 thereon for interengagement with a respective gear lever 132 which operatively engages a respective slide 126 to turn or rotate the print wheel 129 in response to movement of the slide 126 thereby aligning same for printing information concerning the respective key designation. The print wheels 129 each have a plurality of circumferentially spaced print characters 133 on the periphery thereof, each separated by platen aligner notches 134.

The distance that each slide is moved, to the left as shown in FIG. 14, is determined by the size of the respective projection 101'. Each projection 101' is sized to move the print wheel 129 to position the respective print character 133, designating one portion of the code assigned to the person having the respective key 98, to a position to record the code characters representing the respective key.

In the illustrated structure, each gear lever 132 is pivotally mounted on an elongate rod or shaft 135 and a roller 136 is rotatably mounted on each gear lever 132 and positioned to firmly engage the respective slide 126. The gear lever 132 has a gear portion 135 having teeth 132' thereon for meshing with the teeth of the gear 131 and a lever portion 136' having the roller 136 mounted thereon. The elongated rod or shaft 135 is positioned at the intersection of the gear portion and the lever portion whereby movement of the respective slide 126 rotates the print wheel 129 to position a representative print character 133, corresponding to the respective projection

101' of the key 98, for recording the representative code designation of the person assigned to the respective key 98. A suitable resilient member, such as a spring 137, has opposite ends connected to the gear lever 132 and to the slide 126 respectively to position the respective print wheel 129 in a neutral position and overcome any play between the gear teeth 132' and the teeth of the gear 131.

It may be desirable to dispense medicine that requires refrigeration, therefore, it is a simple modification to completely enclose the cabinet 2 and place a suitable refrigeration or cooler unit therein.

It is to be understood that while I have illustrated and described one form of my invention it is not to be limited to these specific forms or arrangement of parts herein described and shown.

I claim:

1. A medicine dispensing apparatus comprising:

- a. a cabinet having a medicine receiving hopper therein;
 - b. a medicine dispensing device mounted in said cabinet and communicating with said hopper;
 - c. a medicine containing magazine movably mounted within said medicine dispensing device;
 - d. a reciprocable plunger positioned to be engaged by said magazine;
 - e. plunger moving means for moving said plunger and magazine from a medicine retaining position to a medicine dispensing position and return;
 - f. an ejecting device operative to dispense a single unit of medicine from said magazine and to maintain the remainder therein; and
 - g. a trap door normally closing an exit of said hopper.
2. A medicine dispensing apparatus comprising:
- a. a cabinet having a medicine receiving hopper therein;
 - b. a plurality of medicine dispensing devices mounted in said cabinet with each communicating with said medicine receiving hopper;
 - c. medicine containing magazines each adapted to be movably mounted within each of said medicine dispensing devices;
 - d. a plurality of reciprocable plungers each positioned to be engaged by one of said respective magazines;
 - e. plunger moving means for moving said respective plunger and magazine from a medicine retaining position to a medicine dispensing position and return;
 - f. ejecting devices for dispensing a single unit of said medicine from said respective magazine while retaining the remainder therein;
 - g. means selectively engaging respective plunger moving means for dispensing said single unit of medicine; and
 - h. a trap door normally closing an exit of said hopper.

3. The medicine dispensing apparatus as set forth in claim 2 including:

- a. a magazine supporting member having a magazine engaging position for initially limiting travel of said respective magazine within said respective medicine dispensing device and a nonengaging position for permitting travel of said respective magazine to said medicine dispensing position; and
- b. said respective plunger being adapted to engage said respective magazine supporting member during said movement from said medicine retaining position to said medicine dispensing position for moving said magazine supporting member from said magazine engaging position to said nonengaging position whereby said respective magazine may travel to said medicine dispensing position in response to said plunger moving means.

4. The medicine dispensing apparatus as set forth in claim 2 wherein each of said magazines includes:

- a. an elongate closed medicine chamber;
- b. an inclined slide surface at one end of said medicine chamber, said slide surface being positioned to be engaged by a first unit of medicine; and
- c. an exit for said units of medicine, said exit being at said one end of said medicine chamber.

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5. The medicine dispensing apparatus as set forth in claim 4 wherein each of said magazines includes:
- a slidable door normally closing said medicine chamber exit;
 - means for opening said slidable door during said travel of said magazine to said medicine dispensing position; and
 - means for closing said slidable door during said return to said medicine retaining position.
6. The medicine dispensing apparatus as set forth in claim 5 wherein:
- said slide surface is beveled downwardly and outwardly adjacent said exit whereby said first unit of medicine engages said slide surface and is positioned adjacent said exit;
 - said medicine chamber is internally shaped to align a plurality of units of medicine therein except said first unit; and
 - an upper edge of said exit is beveled downwardly and outwardly substantially parallel with said slide surface thereby cooperating with said slide surface for ejection of said first unit of medicine when said door is open.
7. The medicine dispensing apparatus as set forth in claim 6 wherein each of said ejecting devices for dispensing a single unit of said medicine includes:
- an interposer slidably mounted in each of said medicine dispensing devices, said interposer having a medicine engaging position extending into said medicine chamber when said respective magazine is in said medicine dispensing position; and
 - a way in each of said magazines communicating with said medicine chamber at said slide surface and shaped to engage and move said respective interposer to said medicine engaging position.
8. The medicine dispensing apparatus as set forth in claim 7 wherein:
- said interposer is positioned in said medicine engaging position during said magazine travel to said medicine dispensing position;
 - said interposer is positioned to engage a side surface of said first unit of medicine and to guide said first unit outwardly from said chamber during said magazine travel to said medicine dispensing position; and
 - said interposer is positioned to engage a second unit of medicine at a bottom surface thereby supporting said remainder of units of medicine in said magazine after said first unit is dispensed.
9. The medicine dispensing apparatus as set forth in claim 8 wherein:
- said second unit of medicine is positioned above said downwardly and outwardly beveled slide surface when engaged by said interposer; and
 - said second unit of medicine is aligned with said remainder of units of medicine when engaged by said interposer.
10. The medicine dispensing apparatus as set forth in claim 3 including resilient means engaging said magazine supporting member and said medicine dispensing device for urging said magazine supporting member into contact with said first unit of medicine, said contact positioning said magazine supporting member in said magazine engaging position whereby said magazine supporting member is positioned to be engaged by said respective plunger.
11. The medicine dispensing apparatus as set forth in claim 10 wherein:
- said magazine supporting member has a second magazine engaging position with said magazine supporting member being positioned for nonengagement by said plunger whereby said magazine remains in engagement with said magazine supporting means; and
 - said resilient means is biased to urge said magazine supporting member into said second magazine engaging position when said medicine chamber contains no units of medicine therein.
12. The medicine dispensing apparatus as set forth in claim 2 including:

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- said cabinet having a door for access to said medicine dispensing devices;
 - hinge means for moving said door between an open position and a closed position;
 - locking means for maintaining said door in said closed position;
 - a movable safety member mounted in said cabinet and having a plurality of projections; and
 - a linkage connected to said locking means and to said safety member operative to move said safety member from an operative position to a safe position when said locking means in unlocked, said safe position having said safety member projections positioned to be engaged by said plungers thereby preventing said plungers moving said respective magazines to said respective medicine dispensing position.
13. The medicine dispensing apparatus as set forth in claim 2 including:
- a selector member mounted on said cabinet and movable between a plurality of selected positions corresponding to respective magazines;
 - detent means retaining said selector member in said respective selected positions; and
 - said plunger moving means being operatively connected to said selector member, said plunger moving means being positioned to engage said respective plunger in response to moving said selector member to said respective selected position.
14. The medicine dispensing apparatus as set forth in claim 13 including:
- key operated means mounted in said cabinet for operating said plunger moving means, said key operated means having an elongate lever movable between a locked position and an operative position;
 - an abutment member mounted on said cabinet and positioned to be engaged by one end of said lever when said lever is in said locked position;
 - an elongate bar mounted in said cabinet, said bar being movable from a first position to a second position and return to said first position, said bar being engaged with said respective plunger moving means during said movement from said first position to said second position, said second position having said respective plunger moving means engaging said plunger while in said medicine dispensing position;
 - a way in said cabinet, said key operated means being movable in said way; and
 - linkage means connecting said key operated means and said bar whereby movement of said key operated means moves said bar from said first position to said second position whereby said bar engages said plunger moving means and moves same with said respective magazine from said medicine retaining position to said medicine dispensing position during movement of said bar from said first position to said second position.
15. The medicine dispensing apparatus as set forth in claim 14 including:
- recording means mounted in said cabinet for recording each selected dispensing of medicine, said recording means being operative to record said respective selected magazine moved to said medicine dispensing position, and
 - a plurality of code designations associated with said recording means representing contents of respective magazines whereby said respective code designation is recorded by said recording means in response to movement of said respective selected magazine to said medicine dispensing position.
16. The medicine dispensing apparatus as set forth in claim 15 including: Time clock means associated with said recording means and operative to record time of each selection of said unit of medicine.
17. The medicine dispensing apparatus as set forth in claim 16 including:

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- a. a plurality of keys each operative to move said lever of said key operative means from said locked position to said operative position;
 - b. each of said keys having a representative code designation; and
 - c. said recording means being responsive to said respective representative code designation.
18. The medicine dispensing apparatus as set forth in claim

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- 13 including:
- a. indicating means mounted on said cabinet and operative to indicate said respective selected position of said plunger moving means; and
 - b. said indicating means being aligned with said respective selected magazine.

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