March 5, 1968 F. J. ABOOD, JR., ET AL 3,371,821

DISPENSING APPARATUS

Filed May 25, 1966 5 Sheets-Sheet 1

FIG. 1

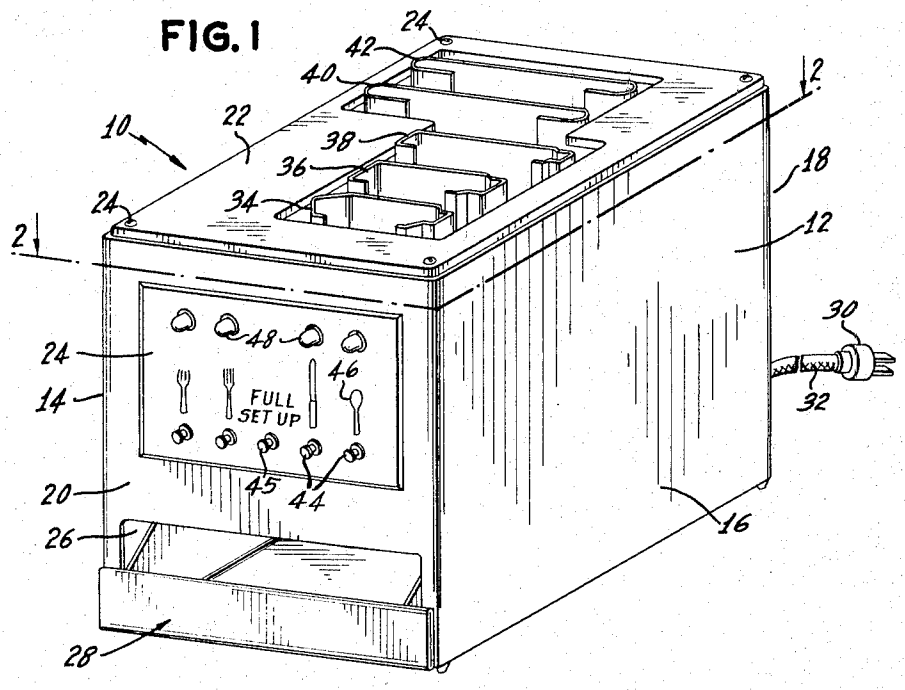
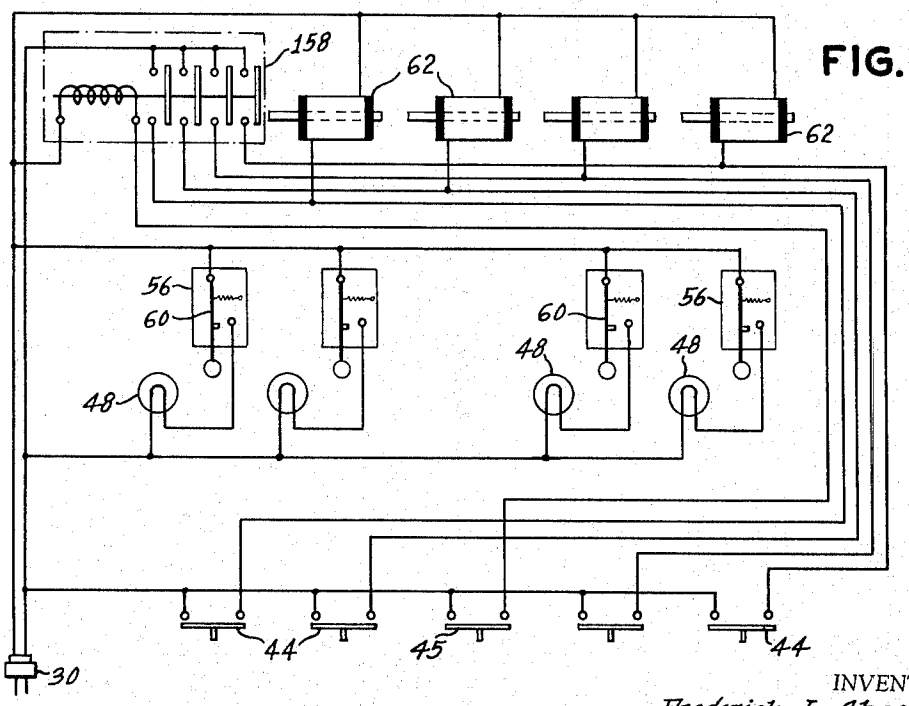


FIG. 8



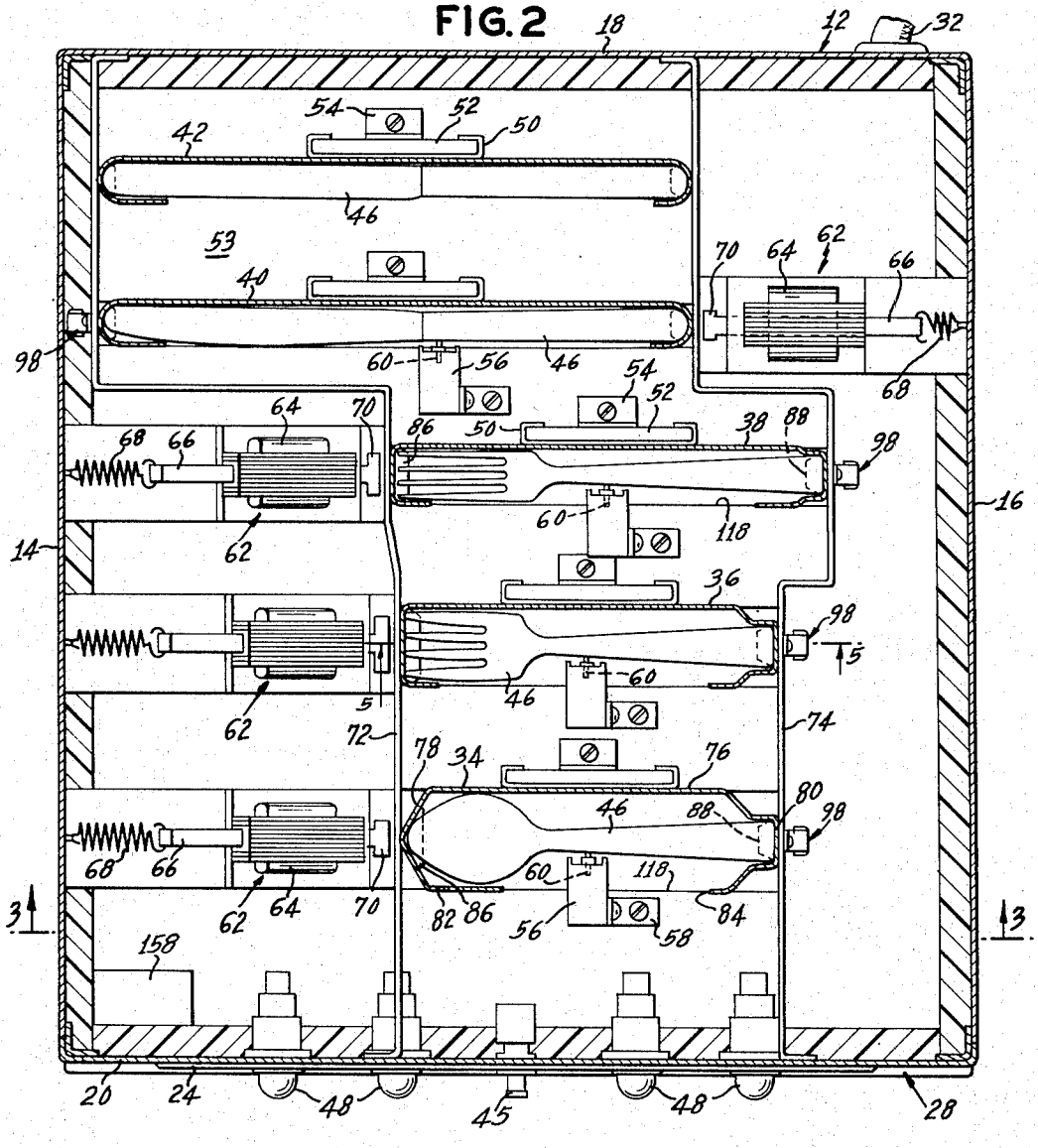
INVENTORS
Frederick J. Abood, Jr
Wolfgang Wieland
BY George H. Baldwin
ATTORNEY

March 5, 1968 F. J. ABOOD, JR., ETAL 3,371,821

DISPENSING APPARATUS

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FIG. 2



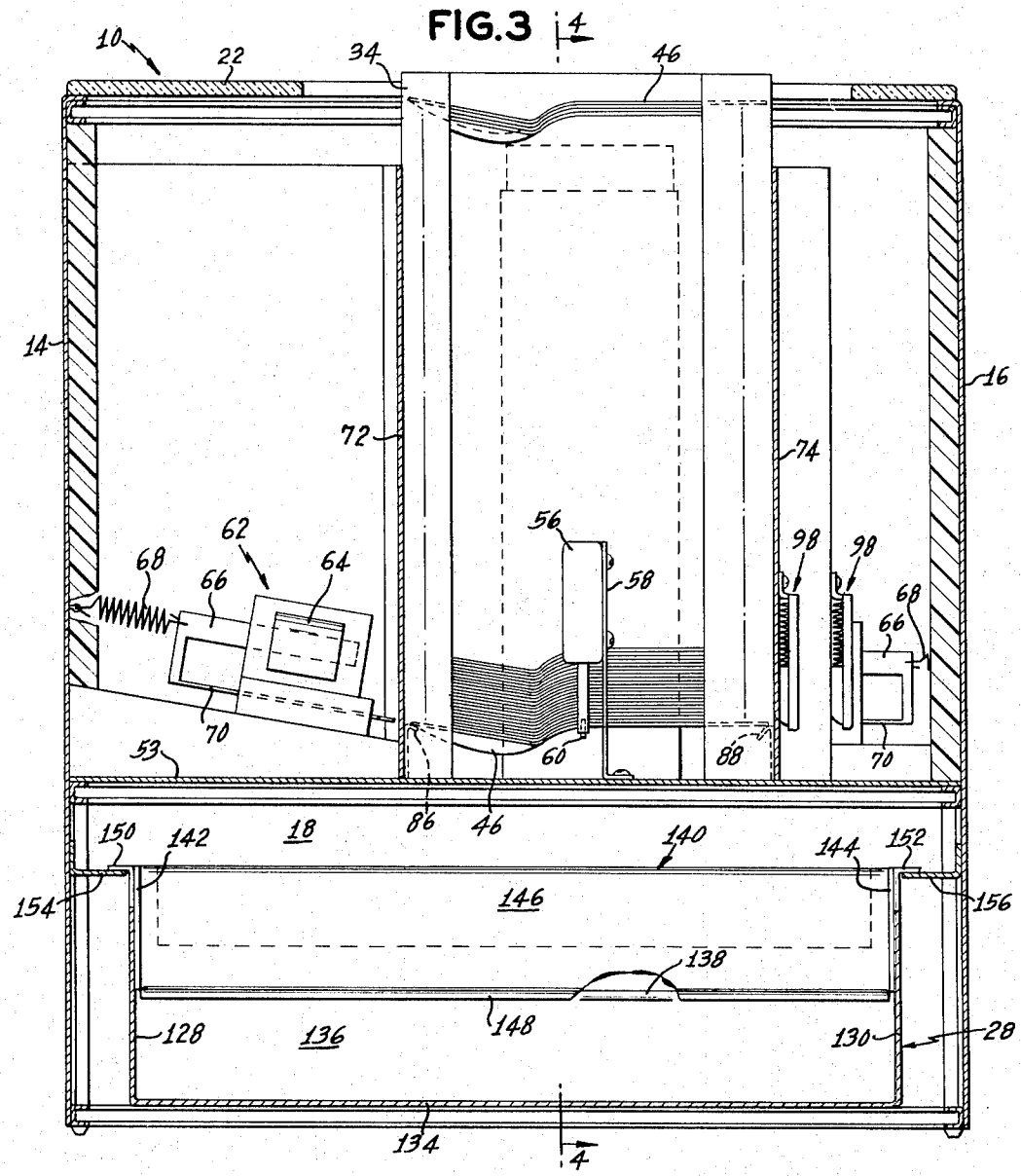
INVENTORS
Frederick J. Abood, Jr.
Wolfgang Wieland
BY
George H. Baldwin
ATTORNEY

March 5, 1968 F. J. ABOOD, JR., ETAL 3,371,821

DISPENSING APPARATUS

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FIG.3



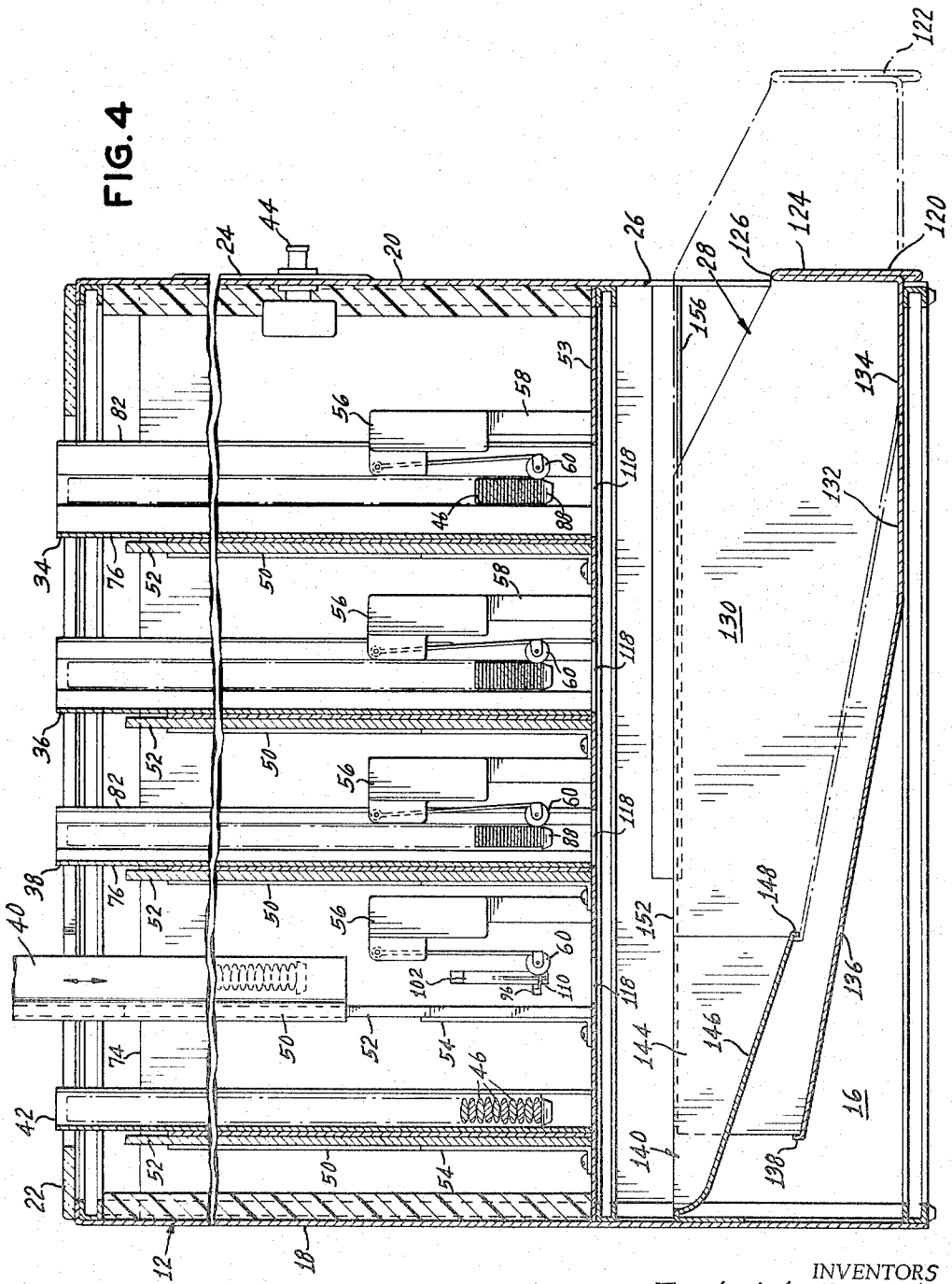
INVENTORS
Frederick J. Abood, Jr.
BY Wolfgang Wieland
George H. Baldwin
ATTORNEY

March 5, 1968 F. J. ABOOD, JR., ETAL 3,371,821

DISPENSING APPARATUS

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FIG. 4



INVENTORS
Frederick J. Abood, Jr.
BY Wolfgang Wieland
George H. Baldwin
ATTORNEY

March 5, 1968 F. J. ABOOD, JR., ETAL 3,371,821

DISPENSING APPARATUS

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FIG. 5

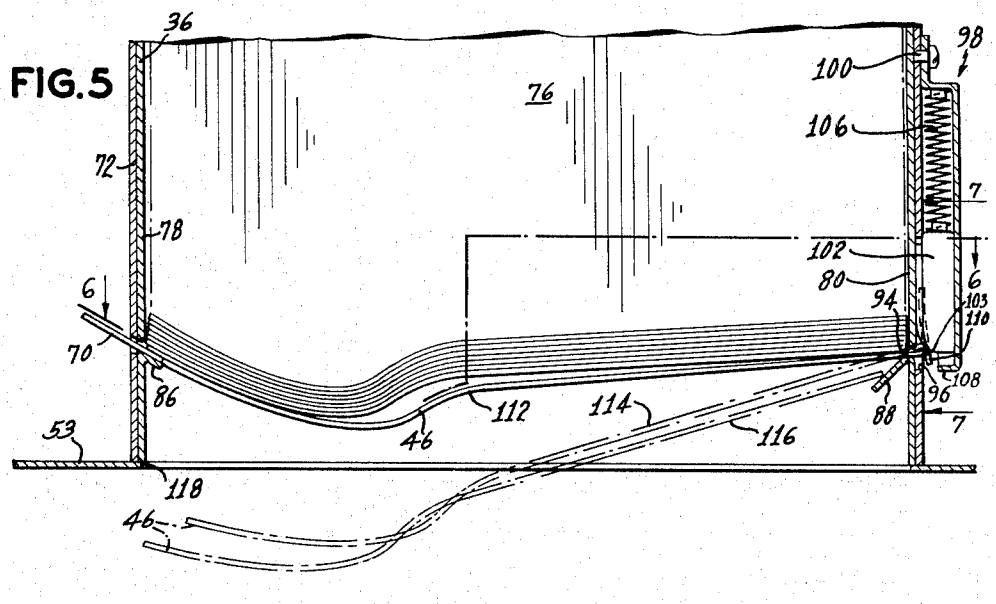
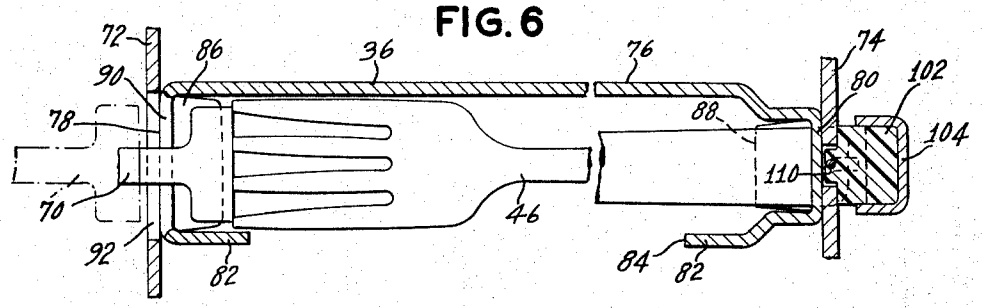


FIG. 6



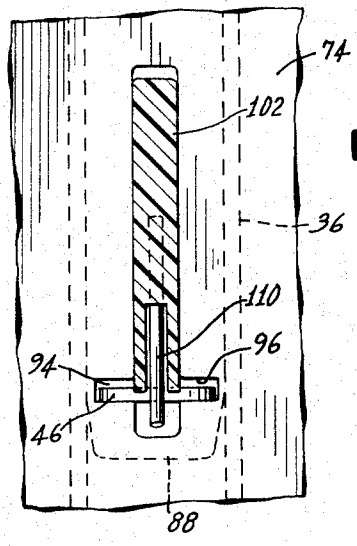


FIG. 7

INVENTORS
Frederick J. Abood, Jr.
BY Wolfgang Wieland
George H. Baldwin
ATTORNEY

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DISPENSING APPARATUS

Frederick J. Abood, Jr., 6455 San Juan Blvd., Apt. 24 32210, and Wolfgang Wieland, 2549 Forest Blvd. 32216, both of Jacksonville, Fla.

Filed May 25, 1966, Ser. No. 552,959
13 Claims. (Cl. 221—93)

ABSTRACT OF THE DISCLOSURE

A dispensing apparatus having a plurality of flatware magazines holding vertical stacks of individual pieces of flatware therein, each magazine being provided with a pair of spaced shoulder means adjacent the lower end of the vertically extending magazine for engaging the lowermost piece of flatware and retaining the entire stack of flatware within the magazine. Selective means are positioned adjacent one end of the magazine and is engagable with and operable to move the lowermost piece of flatware out of engagement with one of the shoulder means and toward the other shoulder means to release the lowermost piece of flatware from the magazine and to permit the next adjacent piece of flatware to descend into supported engagement upon the pair of spaced shoulder means. Each magazine is removably supported on the apparatus with the pair of spaced shoulder means being attached to the magazine and the selective means being supported on the apparatus. The selective means includes an electrically operated dispensing member and electric means to selectively actuate such member to contact the lowermost piece of the flatware in the stack within the magazine to dispense same. A slot is provided in one end wall of the magazine through which the dispensing member extends and retracts and opposite to the slot adjacent the other end wall of the magazine is another slot with a releasing device associated therewith which is tensioned by the movement of the lowermost piece of flatware by the dispensing member through the slot in the one end wall with the releasing device urging the lowermost piece of flatware toward the one end wall of the magazine after such flatware has been moved by the dispensing member from engagement with the adjacent shoulder means on the one end wall. The dispensing member is spring biased to its inoperative position and an electrical solenoid is associated with each dispensing member which is selectively actuated by a switch to dispense the selected piece of flatware in the respective magazine. The selective means also includes a master switch and electrical means for energizing all of the solenoids simultaneously to dispense the lowermost piece of flatware from a plurality of magazines when an entire place setting is desired.

This invention relates to dispensing apparatus, and more particularly to a device for dispensing flatware such as spoons, knives, fork and the like, either individually or a complete place-setting.

It is a general object of this invention to provide an improved apparatus of simple and practical design which is suitable for use in cafeterias and the like, and having means by which flatware articles may be dispensed to the patrons.

Another object of the subject invention is to provide an apparatus for dispensing flatware, wherein like implements are maintained in a closely stacked relationship and are selectively released and dispensed one at a time.

A further object of the invention is to provide an improved flatware dispensing apparatus, wherein like implements are maintained in a closely stacked relationship and wherein only the lowermost implement is permitted to be released and dispensed from the apparatus.

Yet another object of this invention is to provide an improved, automatic, yet simple, flatware dispensing device for use in restaurants, buffets and public eating places generally, and especially of the cafeteria or so-called "automat" or self-service type.

A specific object of the subject invention is to provide an improved flatware dispensing apparatus which automatically dispenses each and every implement desired by the patron and is also capable, without modification, of dispensing a complete place-setting to the patron using the apparatus.

Another specific object of this invention is to provide in a flatware dispensing apparatus a new and improved flatware magazine designed to hold a stack of pieces of flatware and subsequently dispense the same.

The novel features which are believed to be characteristic of this invention are set forth with particularity in the appended claims The invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a front perspective view of the flatware dispensing apparatus of this invention;

FIG. 2 is an enlarged transverse sectional view of the apparatus taken along line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view of the apparatus taken along line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view of the apparatus taken along line 4—4 of FIG. 3;

FIG. 5 is an enlarged partial cross-sectional view of the apparatus taken along line 5—5 of FIG .2;

FIG. 6 is an enlarged cross-sectional view taken along line 6—6 of FIG. 5;

FIG. 7 is an enlarged partial cross-sectional view through the apparatus taken along line 7—7 of FIG. 5; and

FIG. 8 is a diagrammatic view of the electrical circuit of the apparatus of this invention.

Referring now in detail to the drawings and especially to FIGS. 1 to 4, the flatware dispensing apparatus of this invention, being generally designated by reference numeral 10, comprises an exterior housing 12, including two upstanding side walls 14 and 16, an upstanding back wall 18, an upstanding front wall 20 and a removable top portion 22, which is secured by suitable means, such as screws 24, to the wall portions of the housing 12. Attached to front wall 20 is an indicator and control panel 24, and extending through opening 26 in the lower portion of front wall 20 is a slidable and removable tray or drawer 28 to direct the dispensed flatware toward the patron at the front of the apparatus. Flatware dispenser 10 includes an electrical plug 30 and an electrical lead

32 such as to provide electrical energy to the circuit components, hereinafter more fully described.

The dispensing apparatus is provided with a number of cartridges or magazines 34 through 42 for holding the flatware or implements in a stacked, closely adjacent relationship, one on top of the other in preparation for being dispensed or released by the apparatus to the tray 28 extending underneath the magazines. Each magazine 34 through 42 is designed to hold only a particular implement or item of flatware, such as for example, magazine 36 is constructed to accommodate salad forks; magazine 38, for dinner forks; magazine 34, for spoons; magazine 40, for knives; and magazine 42 is a spare or extra knife magazine identical to magazine 40. Knife magazine 42 is inoperative to dispense or discharge knives in the position in which it is depicted, but can be made to operate if placed in the position occupied by magazine 40, as will be apparent. While the flatware dispensing apparatus as depicted in the embodiment shown is constructed with four operative magazines, it is of course understood, that it could be constructed with more or fewer magazines as desired. Since the knives do not nest one within another when stacked, the present apparatus was constructed with a spare knife magazine so that the total number of knives carried by the spare magazine 42 and operatively disposed knife magazine 40 closely approximates the total number of each of the spoons and forks in their respective magazines of the flatware dispenser disclosed herein.

Control panel 24 is provided with push button type switches 44 to automatically and individually dispense each item or implement of flatware as desired. Switch 45 of switches 44 is provided to dispense when actuated a complete or full place-setting, comprising one each of every implement or item of flatware contained within the magazines 34 to 40. Indicia 46 is provided on the control panel 24 to indicate which item of flatware or implement is obtained by pushing a particular push button switch 44 corresponding to the particular indicia 46 associated therewith. Warning lights 48 which correspond to respective implement indicia 46, utensils in the magazines and respective push button 44 are provided so that the attendant caring for the dispensing apparatus may be warned when the supply of implements in any one magazine 34 through 40 becomes low and nearly exhausted, such that he may replace such magazine with another fully loaded magazine or fill the nearly empty magazine with additional appropriate implements.

Each implement cartridge or magazine 34 through 42 is formed and shaped to conform to the size and general configuration of the item of tableware which it is intended to dispense, as best seen in FIGS. 2 and 3. The apparatus of this invention and particularly the positioning of implement magazines 34 to 40 within the housing is so arranged that the handles of all the utensils are adjacently aligned and point in the same general direction, as is most clearly depicted in FIG. 2. The purpose of this arrangement of the utensils, being such that upon the dispensing of a full-place setting or individual pieces of flatware, the same are delivered to the patron using the device with all the handles of the utensils being adjacently aligned, pointing in the same general direction so that the patron may readily grasp the same by their handles and not some by the handles and others by the eating end thereof. Each of the individual magazines has secured to its backside a channel-like member 50 which rises in a generally vertical manner substantially throughout the height of the magazine. A vertical support member 52 is supported within housing 12 on a generally horizontally extending inner bottom wall 53 by attachment to a bracket 54 connected to wall 53. Support member 52 is located adjacent each of the magazines in a manner such that channel-like member 50 may slidingly engage member 52, to arrange the magazine in its proper operative position within the housing. Support member 52 is telescoped within channel-like member 50, and member 50, together with the attached magazine 42, may slide up and down member 52, and be removed therefrom for refilling and/or cleaning and repairing. The manner in which magazine 40 may slide on upstanding member 52 is depicted more clearly in FIG. 4.

A series of pressure-type micro switches 56 are provided within the housing 12 and mounted to the inner bottom wall 53 by suitable brackets 58. Each micro switch 56 is positioned closely adjacent the open front side of each upstanding implement magazine 34 through 40 within the housing 12, and the operative member 60 of each micro switch 58 contacts the implements stacked within their respective magazine. Should the supply of implements in any magazine become low and nearly exhausted, operative member 60 of the micro switch 56 will be activated by a compression spring to move same into the space previously occupied by the stacked implements, as depicted beneath magazine 40 in FIG. 4. This movement of operative member 60 will close and activate the electrical circuit and the proper indicating light 48 within control panel 24 will be energized to indicate to the attendant that additional items of flatware are needed in that particular magazine or to replace that empty magazine with a loaded magazine.

Each magazine has associated therewith a solenoid actuated operating mechanism 62 adjacent one of its ends and mounted to the inner bottom wall 53 of the dispensing apparatus. Each mechanism includes a solenoid 64, a solenoid plunger 66, a return tension spring 68 attached between the respective side walls 14 and 16 of the housing 12 and solenoid member 66, so as to return solenoid plunger 66 to its neutral or inactive position as depicted in FIG. 3. There is additionally an operating lever 70 attached to solenoid member 66 and operable therewith to selectively engage the items of flatware stacked in the adjacent corresponding implement magazine when the solenoid 64 is activated as more fully disclosed in connection with FIGS. 5 to 7.

Utensil magazines 34 through 42 fit closely between vertically upstanding interior walls 72 and 74 within the housing 12 of the flatware dispensing apparatus, which arrangement may be seen in FIG. 2. Each of the utensil magazines 34 through 42 is provided with a back wall 76, two end walls 78 and 80 and a partial front wall 82, having a central opening 84 throughout its entire height. The back 76, ends 78 and 80, and front 82 walls of each respective implement magazine 34 to 42 are designed and constructed to generally conform to and closely fit the general outline of the respective article of flatware to be dispensed by each respective magazine. The fit between the magazine walls and the implement is particularly close at the ends of the implement to prevent the implement from turning or twisting in the magazine, yet not so close as to prevent the same from moving easily and smoothly up and down in a vertical direction within the magazine. Each implement holder is provided with a pair of inwardly extending ribs or shoulders 86 and 88 adjacent the bottom edge of end walls 78 and 80 respectively. Shoulders 86 and 88 function as stops to maintain the bottom or lowermost item of flatware within the magazine together with the remainder of the stack of implements from falling therethrough. The implements may be stacked or loaded in their respective magazines 34 through 42 by hand through opening 84 in front wall 82; passing the utensil from the top of the magazine toward the bottom thereof, while being careful to insure that the lowermost implement in the stack engages shoulders 86 and 88, and the other implements engage one another in a flat manner. The implements could also be stacked in the magazines by other means, such as mechanical means, automatic means, and the like. A suitable slot or opening 90 is provided in end wall 78 of the magazine generally above and closely adjacent shoulder 86 and a similar slot or opening 92 is provided in upstanding wall 72 in alignment with opening 90. Operating lever 70 of the solenoid actuated operating mechanism 62 moves forwardly through opening 92 in upright wall 72 and through opening 90 in maga-

zine end wall **78** to move a single utensil rearwardly so that the front portion of the implement clears stop **86**. Additional slots or openings **94** and **96** are respectively provided in magazine end wall **80** and upstanding wall **74** to permit the implement being dispensed to move rearward through these openings as the same is being pushed by member **70** during the dispensing operation, which will be explained more fully hereinafter.

To aid in ejecting or dispensing the utensil from its stacked position in each of the cartridges an auxiliary ejecting mechanism **98**, best seen in FIGS. 5, 6 and 7, is provided in cooperative association with each of the implement magazines **34** through **40** when they are appropriately placed within the housing of the dispensing apparatus. Auxiliary ejecting mechanisms **98** associated with magazines **34**, **36** and **38** are attached to upright interior wall **74** and mechanism **98** associated with magazine **40** is attached to upright interior wall **72**, the salad fork magazine **36** being depicted in FIG. 5, attached by screws or the like to wall **74** as at **100**. It is also contemplated by this invention that the auxiliary ejecting mechanisms **98** could be attached to or made a part of one end of the respective flatware magazines **34** through **42**. Each auxiliary ejection mechanism **98** includes a plastic member **102**, for example, Teflon or the like, which slides generally vertically upward and downward between wall **74** and an outer housing **104** of the ejection mechanism. Plastic member **102** is urged downwardly by a coiled spring **106** and rests or engages upon shoulder **108** of housing **104**, and in this position the lower edge of plastic member **102** is adjacent openings **94** and **96**. The lowermost edge **103** of plastic member **102** adjacent openings **94** and **96** is beveled or rounded, such that when one end of an implement moving rearwardly through openings **94** and **96** comes into contact with plastic member **102** the implement forces member **102** upward against the resistance of coiled spring **106**. To additionally aid in ejecting the implement from the magazine a piece of spring wire **110** is embedded in or attached to the plastic member **102** above its lower edge **103** and protrudes downward therefrom a predetermined distance to kick the one end of the implement from the magazine and prevent the same from jamming or hanging-up with the openings **94** and **96**.

The operation of ejecting or dispensing an item of flatware from one of the cartridges can be understood with reference to FIGS. 5 and 6. The proper push-button type switch **44** to correspond with the item of flatware desired to be dispensed is first chosen from those on the control panel **24**. The so selected switch **44** is then pushed to energize its circuit and activate solenoid **64** such that the solenoid plunger **66** will move from its inoperative position, as depicted in FIG. 3, into and through solenoid **64**. When the plunger **66** moves forwardly the attached operating lever or dispensing member **70** moves forwardly to begin forcing the lowermost implement contained within the adjacent cooperating magazine. The solenoid actuated operating mechanisms **62** adjacent the magazines carrying spoons and forks are mounted within the housing of the apparatus such that their dispensing members **70** lie and move in the same plane as the plane defined by the tines of the lowermost fork in the adjacent fork magazines or the plane as defined by the upper edge of the bowl of the lowermost spoon in the adjacent spoon containing magazine; this particular mounting of operating mechanism **62** is seen in FIG. 3. In this connection it should be noted that the upper surface of the operative or eating end portion of the lowermost piece of nested flatware (this being the upper surface of the tines of the fork or the upper surface of the bowl of the spoon) lies in a predetermined plane while being supported by the shoulders **86** and **88**, and that this plane forms an acute angle with a plane passing through the slots **90** and **94** in the ends of the magazine; and that the respective dispensing members **70** adjacent the fork and spoon magazines are adapted and arranged to move generally in that same acute plane to contact and move the forward or eating end portion of the lowermost pieces of nested flatware in a direction tending to unnest the same from the juxtaposed pieces of flatware. The operating mechanism **62** opposite the knife containing magazine is mounted horizontally such that its dispensing member **70** lies in the same horizontal plane as defined by the lowermost knife contained in that magazine. The dispensing member **70** which cooperates with the adjacent knife magazine **40** is so mounted within the apparatus that it acts upon the handle of the knife. Member **70** could also be mounted to act upon the knife blade, but as that could be injurious to the knife blade and might present problems of plunger contact therewith, the mounting of member **70**, as depicted in the embodiment shown, is preferred. As dispensing member **70** moves forward to act upon the lowermost fork or spoon in the adjacent magazine (as for example, depicted in FIG. 5) the implement moves rearwardly a slight distance to assume the position indicated by reference numeral **112**. As the lowermost fork or spoon moves rearwardly from the force of member **70** the nesting relationship between it and the next lowermost implement is overcome. In this short rearward movement of the lowermost implement, during which the nesting relationship is broken, the entire stack of implements in the magazine is made to rise slightly. With this invention it has been found advantageous and highly desirable, to adequately overcome the nesting relationship between adjacent forks and spoons and to obtain the proper operation of the device and dispensing of the utensils, for the dispensing members **70** to act upon the forward or eating end of the forks and spoons. Therefore operating mechanisms **62** adjacent cooperating fork and spoon magazines **34** to **38** are mounted such that their dispensing members **70** act upon the forward end of the forks and spoons. In position **112** the rear end of the implement has moved through slots or openings **94** and **96** in walls **80** and **74** respectively, and has abutted against the inner and lowermost edge of plastic member **102**, forcing the same to move slightly upward against the bias of spring **106**, and has come into contact with, and moved rearwardly against wire spring **110**, thereby tensioning same. It will also be noted that in position **112** the front or forward edge of the implement has cleared shoulder or stop **86**, such that this forward end may drop downward to the new position indicated by reference numeral **114**, while dispensing member **70** and shoulder **86** maintains the remaining implements within the magazine. Once the forward end of the implement has moved downward into position **114** from the previously occupied position **112**, the back or rearward end of the implement will be forced outward through openings **94** and **96** by the action of plastic member **102** and its cooperative compressed coil spring **106** which acts to force member **102** downward. Tensioned spring wire **110** will also force the rearward end of the implement forwardly through openings **94** and **96** thereby preventing jams of the implement, and the implement then falls freely away from the magazine as represented by the broken lines **116**. When the previously depressed push button **44** is released dispensing member **70** moves rearward through slots **90** and **92** out of the magazine, being pulled backwards by means of attached spring **68** whereby the bottom implement of those remaining in the stack, within the magazine comes to rest on shoulder **86**.

Appropriate openings **118** are provided through the inner bottom wall **53** of the housing such that the ejected and dispensed items of flatware may fall therethrough and into the drawer-like tray **28** provided within the bottom of the apparatus. Drawer **28** functions as a receptacle for the implements dispensed or ejected from magazines **34** through **40**, whereby the patron using the apparatus may easily and readily receive and gather the desired pieces of flatware. This drawer is slidable and movable within housing **12** from its closed position at **120** to its extended broken line position at **122**, as shown in

FIG. 4. The extended position 122 permits the contents of the drawer to be more readily accessible and available to the patron using the device. The front 124 of the drawer extends upwardly to a top edge 126 spaced downwardly from the upper edge defining opening 26 to permit the hand of the patron using the device to readily grasp the implement dispensed into the drawer. The drawer includes two generally vertical upright side portions 128 and 130, an open top and a bottom 132; the front portion 134 of which is generally flat and a rear portion 136 which is inclined upwardly terminating in an upper edge 138. The drawer cooperates in combination with a fixed and inclined chute 140 positioned within the housing and extending from back wall 18 toward the front of the apparatus terminating adjacently forwardly of operative knife magazine 40 and opening 118 therebelow. Chute 140 includes generally upstanding side walls 142 and 144 and inclined bottom portion 146, the lower front chute edge 148 of bottom portion 146 being turned downwardly to abut the upwardly turned drawer back edge 138 of inclined rear portion 136 when the drawer is fully extended. Should it be desired to completely remove drawer 28 from the apparatus, the abutment between edges 138 and 148 may be circumvented by slightly raising the front edge 124 of the drawer, after which the drawer is free to slide completely out of the housing 12. The upper edges of drawer sides 128 and 130 are turned over to provide generally horizontal flanges at 150 and 152 which slide on elongated angle support members 154 and 156 attached along respective side walls 14 and 16 of the apparatus.

The electrical diagram is depicted in FIG. 8 and illustrates the power circuitry utilized in this flatware dispensing apparatus, which is seen to include a number of push-button type switches 44, one being supplied for each type of implement to be dispensed in the particular designed apparatus in accord with the invention, and an additional switch 45 being supplied in the center to give a patron a full place setting, if so desired. Push button switches 44 are connected in circuit with the solenoid actuated operating mechanisms 62 adjacent each of the implement magazines 34 through 40. A four pole, double-throw relay 158 is provided in circuit between switch 45 and the entire bank of solenoid actuated operating mechanisms 62 to operate all of such mechanisms when an entire place setting is desired. Indicating lamps 48 are provided in circuit with micro switches 56 which are adjacent each implement magazine 34 through 40 and are energized when respective micro-switch operating members 60 complete the lamp circuit upon moving inward of the implement magazine when the same becomes substantially empty.

In the embodiment shown, the flatware dispensing apparatus is seen to include a plurality of flatware magazines 34 through 42, each of which is adapted to receive and hold a stack of individual pieces of flatware to be subsequently dispensed. The magazines are removably supported in their operative and generally upright positions within the apparatus on inner bottom wall 53 by means of channel-like members 50, vertical support members 52 and brackets 54 connected to the bottom wall 53. Each of the magazines has a generally vertical back wall 76, generally vertical front wall 82, having an open center portion 84 throughout its vertical dimension, opposite end walls 78 and 80 connecting the back and front walls, and each magazine is adapted and arranged to receive the pieces of flatware through its open top and dispense the lowermost piece of flatware through its open bottom. The magazines also have spaced shoulders 86 and 88 positioned respectively on opposite end walls 78 and 80 adjacent the open bottom to engage the lowermost piece of flatware prior to dispensing thereof and to maintain the stack of flatware within the magazine. There are generally horizontally extending slots 90 and 94 in each of the end walls of the magazines above and closely adjacent the shoulders 86 and 88 respectively. Each magazine has associated therewith and adjacent thereto an operating or dispensing mechanism 62, including a dispensing member 70 biased by spring 68 to its inoperative position, electrical solenoid 64 and switch 44 electrically connected to the solenoid 64. Upon activation of switch 44 solenoid 64 is energized which activates dispensing member 70 from its inoperative position to move through slot 90 and contact and move the lowermost piece of flatware laterally of its stack and from engagement with the adjacent shoulder 86 toward the other wall and into slot 94 therein so that the lowermost piece of flatware is generally free to fall from the magazine upon disengagement with the shoulder 86 adjacent dispensing member 70. The magazines are additionally provided with a releasing device 98 adjacent end wall 80 and slot 94. The releasing device 98 becomes tensioned by movement of the lowermost piece of flatware by the dispensing member 70 through slot 94 in the end wall 80 such that the releasing device will urge the lowermost piece of flatware toward end wall 78 of the magazine after the same has been moved from engagement with the shoulder 86 on end wall 78, thereby assuring dispensing of the piece of flatware from the magazine and preventing jamming thereof between the stack of flatware and shoulder 88 on end wall 80. Addittionally a master switch 45 and a four pole electrical relay 158 are provided and electrically connected to the solenoid actuated operating mechanisms 62 adjacent flatware magazines 34 through 40 for simultaneously dispensing the lowermost pieces of flatware from magazines 34 through 40.

While only a certain preferred embodiment of this invention has been shown and described by way of illustration, many modifications will occur to those skilled in the art and it is, therefore, desired that it be understood that it is intended in the appended claims to cover all such modifications as fall within the true spirit and scope of this invention.

What is claimed as new and what it is desired to secure by Letters Patent of the United States is:

1. In a dispensing apparatus the combination comprising a flatware magazine adapted to receive and hold a stack of individual pieces of flatware to be dispensed, said magazine having a pair of spaced shoulder means adjacent one end thereof for engaging the adjacent endmost piece of flatware and retaining said stack within said magazine, selective means adjacent said end and engageable with and operable to move the endmost piece of flatware out of engagement with one of said shoulder means and toward the other said shoulder means to release said endmost piece from said magazine and to permit the next adjacent piece to move into supported engagement upon said pair of shoulder means.

2. In the dispensing apparatus as defined in claim 1 wherein said flatware magazine is removably supported on said apparatus in a predetermined operative position, said pair of spaced shoulder means being within and attached to said magazine adjacent said one end, and said selective means being adjacent said one shoulder means when said magazine is supported on said apparatus in said predetermined operative position.

3. In the dispensing apparatus as defined in claim 2 wherein said flatware magazine is removably supported on said apparatus in an upright operative position with said one end constituting the bottom and disposed below the opposite top end thereof, said pair of spaced shoulder means being within and attached to said magazine adjacent said bottom end to engage the lowermost piece of flatware and retain said stack within said magazine, and said selective means being positioned above and adjacent said one shoulder means when said magazine is supported on said apparatus in said upright operative position.

4. In the dispensing apparatus as defined in claim 3 wherein said flatware magazine includes a generally vertical back wall, a generally vertical front wall having an

open center portion throughout its vertical dimension and opposite end walls connecting said back and front walls, said magazine being adapted and arranged to receive the pieces of flatware through its open top and to dispense the lowermost piece of flatware through its open bottom, and said pair of spaced shoulder means being positioned respectively on said opposite end walls and adjacent said open bottom to engage the lowermost piece of flatware prior to dispensing thereof.

5. In the dispensing apparatus as defined in claim **3** wherein said selective means includes an electrically operated dispensing member and electrical means to selectively actuate same, said electrical means actuating said dispensing member to contact and move the lowermost piece of flatware laterally of the stack and from engagement with one of said shoulder means toward said other shoulder means thereby releasing the lowermost piece from said magazine.

6. In the dispensing apparatus as defined in claim **4** further comprising a generally horizontally extending slot in each said magazine end wall above and closely adjacent said one shoulder means, said selective means including a dispensing member adjacent said slot in one said end wall, said dispensing member being operative to move through said slot in said one end wall to move the lowermost piece of flatware from engagement with the adjacent said one shoulder means toward the other said end wall and into said slot therein, the lowermost piece of flatware being generally free to fall from said magazine upon disengagement with the adjacent said one shoulder means.

7. In the dispensing apparatus as defined in claim **6** further including a releasing device adjacent said other end wall of said magazine disposed adjacent said slot therein, said releasing device being tensioned by movement of the lowermost piece of flatware by said dispensing member through said slot in said other end wall, said releasing device urging the lowermost piece of flatware toward said one end wall of said magazine after the same is moved by said dispensing member from engagement with said one shoulder means on said one end wall thereby assuring dispensing thereof from said magazine and preventing jamming thereof between the stack of flatware and said other shoulder means on said other end wall.

8. In the dispensing apparatus as defined in claim **6** wherein each piece of flatware nests on the juxtaposed piece of flatware, each piece of flatware having a handle end portion and an opposite operative end portion, each said handle end portion being positioned adjacent said slot in said other end wall, each said opposite operative end portion being positioned adjacent said slot in said one end wall, said dispensing member being operative to move through said slot in said one end wall and contact said opposite operative end portion of the lowermost piece of flatware to move same from engagement with the adjacent said one shoulder means thereby permitting said piece of flatware to be dispensed from said magazine.

9. In the dispensing apparatus as defined in claim **8** wherein the upper surface of said opposite operative end portion of the lowermost piece of flatware lies in a predetermined plane while being supported by the adjacent said one shoulder means said plane being at an acute angle with the plane passing through said slots, said dispensing member being adapted and arranged to move generally in said acute plane to contact and move said opposite operative end portion of the lowermost piece of flatware in a direction tending to unnest same from the juxtaposed piece of flatware.

10. In the dispensing apparatus as defined in claim **3**, further including at least one additional flatware magazine, said additional magazine being adapted to receive and hold another stack of pieces of flatware, said additional magazine having a pair of spaced shoulder means adjacent its inner bottom for engaging the lowermost piece of flatware in said other stack thereby maintaining said other stack within said additional magazine, selective means adjacent said additional magazine above said spaced shoulder means and engageable with and operative to move the lowermost piece of flatware in said other stack out of engagement with one of said shoulder means and towards the other said shoulder means thereby releasing said lowermost piece of flatware in said other stack from its said additional magazine and to permit the next above piece to descend into supported engagement upon said pair of shoulder means.

11. In the dispensing apparatus as defined in claim **10** further including means associated with said magazine and additional magazine for simultaneously dispensing the lowermost pieces of flatware from said magazine and additional magazine.

12. In the dispensing apparatus as defined in claim **11** wherein each selective means includes a dispensing member being spring biased to its inoperative position, an electrical solenoid associated with said dispensing member, a switch, electrical means connecting said switch and said solenoid, said solenoid being energized upon selective activation of said switch, said dispensing member being actuated by said energized solenoid from its inoperative position to contact and move the lowermost piece of flatware from engagement with one of said shoulder means toward said other shoulder means thereby releasing the lowermost piece from its magazine, said means associated with said magazine and additional magazine including a master switch and electrical means for energizing all said solenoids whereby the lowermost pieces of flatware are simultaneously and respectively dispensed from said magazine and additional magazine.

13. In a dispensing apparatus for selectively dispensing an individual piece of flatware and a plurality of pieces of flatware, the combination comprising a plurality of flatware magazines, each of said magazines being adapted to receive and hold a stack of individual pieces of flatware to be dispensed, means for removably supporting said magazines in an operative and generally upright position on said apparatus, each said magazine including a generally vertical back wall, a generally vertical front wall having an open center portion throughout its vertical dimension and opposite end walls connecting said back and front walls, each said magazine being adapted and arranged to receive the pieces of flatware through its open top and to dispense the lowermost piece of flatware through its open bottom, each said magazine having a pair of spaced shoulder means positioned respectively on said opposite end walls and adjacent said open bottom to engage the lowermost piece of flatware prior to dispensing thereof to thereby maintain said stack within said magazine, selective means associated with each said magazine above said spaced shoulder means, a generally horizontally extending slot in each said end wall of each said magazine above and closely adjacent said shoulder means, each said selective means including a dispensing member spring biased to its inoperative position and positioned adjacent said slot in one said end wall, each said selective means further including electrical solenoid associated with said dispensing member and a switch and electrical means connecting said switch and said solenoid, each said solenoid being energized upon selective activation of its associated said switch, each said dispensing member being actuated by its associated said energized solenoid from its inoperative position to move through said slot in said one end wall to contact and move the lowermost piece of flatware laterally of its respective stack and from engagement with the adjacent said shoulder means toward the other said end wall and into said slot therein, the lowermost piece of flatware being generally free to fall from said magazine upon disengagement with said adjacent shoulder means, a releasing device adjacent the said other end wall of each said magazine disposed adjacent said slot therein, said releasing device being tensioned by movement of the lowermost piece of flatware by said

dispensing member through said slot in said other end wall, said releasing device urging the lowermost piece of flatware toward said one end wall of said magazine after the same is moved by said dispensing member from engagement with said adjacent shoulder means on said one end wall thereby assuring dispensing thereof from said magazine and preventing jamming thereof between the stack flatware and said shoulder means on said other end wall, and means associated with said plurality of magazines for simultaneously dispensing the lowermost pieces of flatware from said plurality of magazines, said last means including a master switch and electrical means for energizing all said solenoids.

References Cited

UNITED STATES PATENTS

1,801,165	4/1931	Macke	221—238
2,149,099	2/1939	Phinney et al.	221—293 X
2,903,158	9/1959	Howard	221—261
3,028,048	4/1962	Klammer	221—93
3,036,731	5/1962	Cozart	221—268 X

STANLEY H. TOLLBERG, *Primary Examiner.*