

Jan. 25, 1966

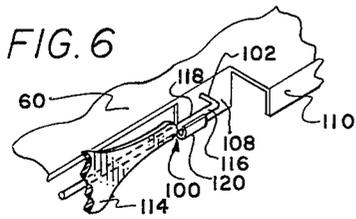
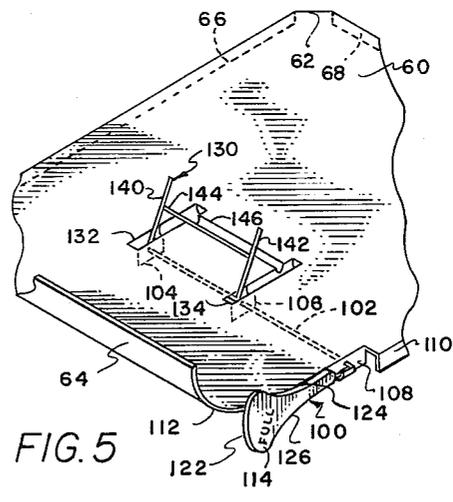
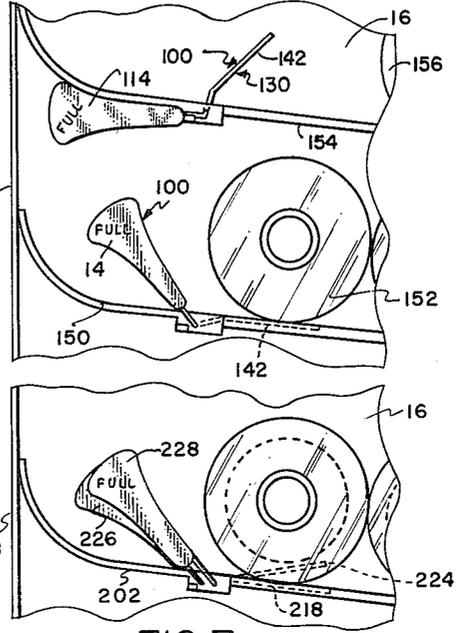
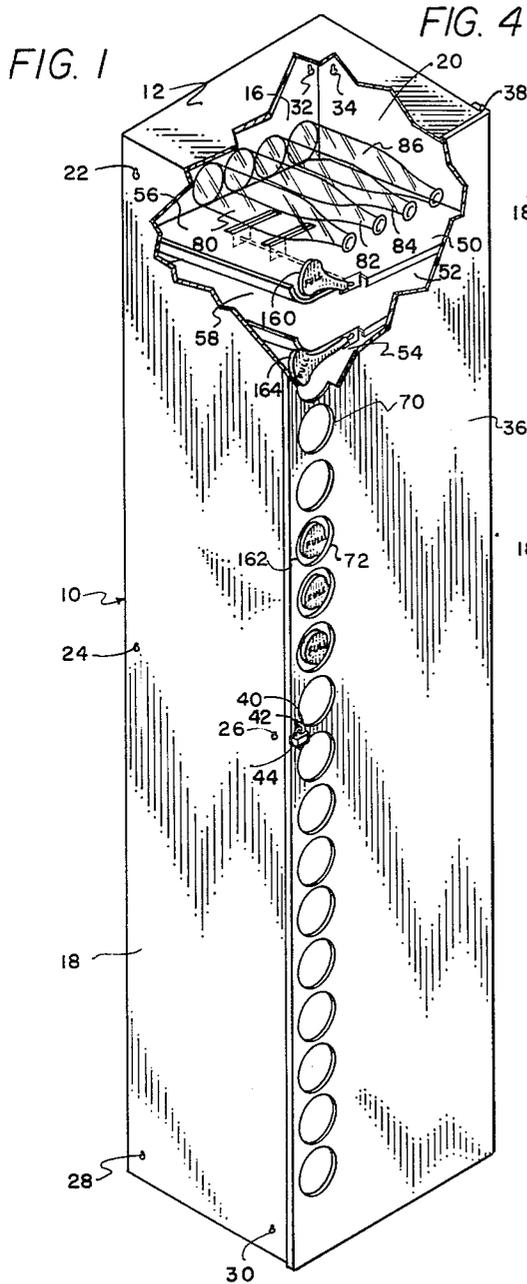
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PILFERAGE RESISTANT BOTTLE STORAGE MEANS

Filed April 15, 1964

2 Sheets-Sheet 1



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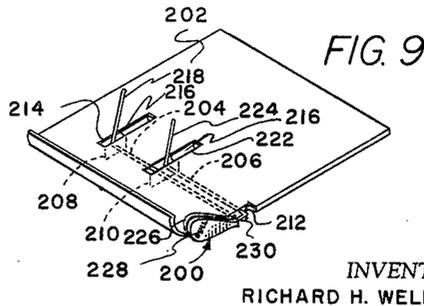
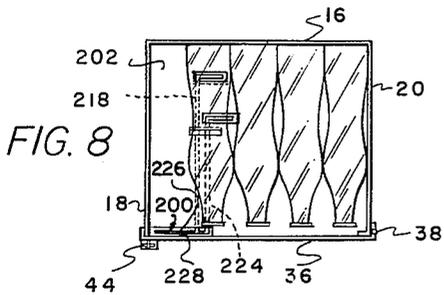
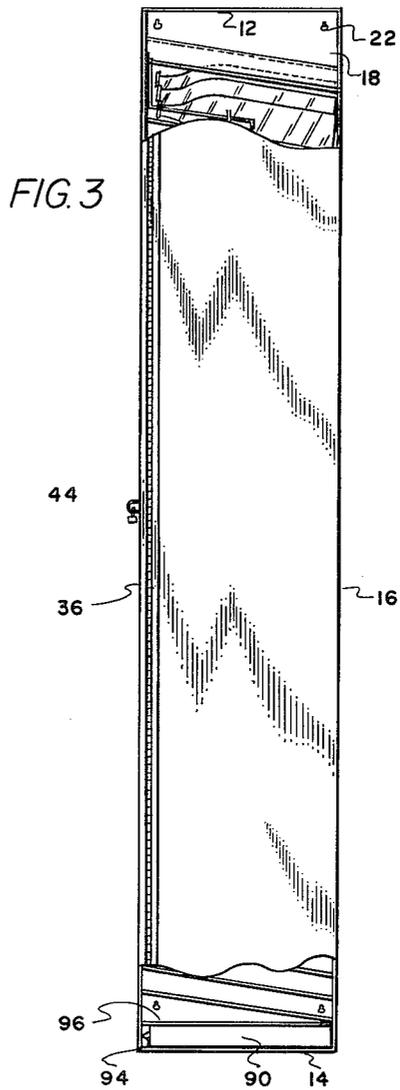
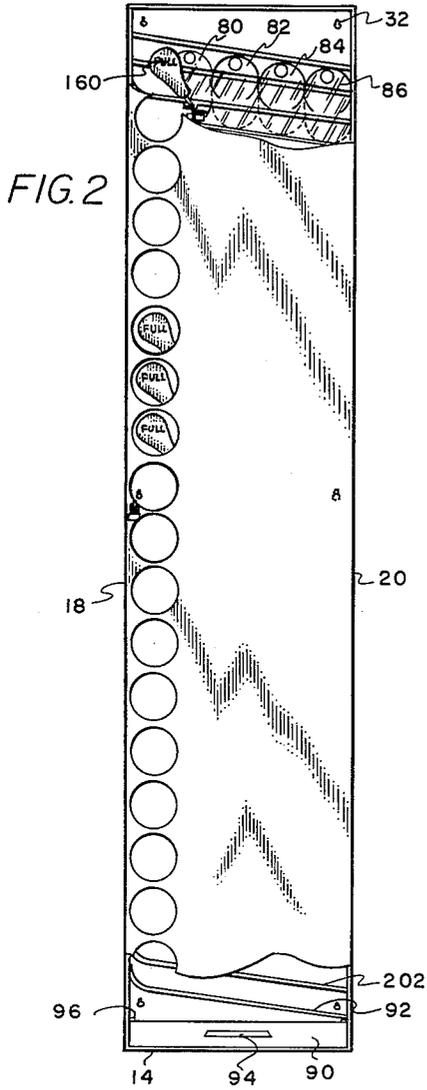
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PILFERAGE RESISTANT BOTTLE STORAGE MEANS

Filed April 15, 1964

2 Sheets-Sheet 2



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PILFERAGE RESISTANT BOTTLE STORAGE MEANS

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Filed Apr. 15, 1964, Ser. No. 359,906
20 Claims. (Cl. 312—234)

This invention relates to new and useful improvements in receptacles for elongated objects which are of approximately circular peripheral cross section along their lengths (not necessarily of constant radius along the length), and more particularly this invention pertains to storage receptacles of such character that resist unauthorized removal of objects stored therein. With greater specificity, the invention relates to a receptacle specially adapted to receive for storage therein empty soft drink bottles, and from which pilferage of empty bottles for the monetary or exchange value thereof is resisted, with lock controlled provision for access being provided such that authorized personnel may readily recover bottles stored therein for subsequent refilling.

While the subject invention obviously will have utility in the pilferage resistant storage of many other objects of the general character specified, the invention is especially well suited for and has for its paramount object the effecting of a solution or at least affording substantial relief for an immediate, widespread and pressing problem occasioned by bottle theft losses incurred by those engaged in the business of vending bottled soft drinks (whether such vending is by coin-operated vending machines or otherwise) in all situations wherein the empty bottles are returned to the owner (soft drink vendor) thereof by placing the same in an empty bottle container or receptacle at a location that is readily accessible to thieves.

The problem is especially acute where the bottled drink vending operation is conducted as a mere incidental to the conduct of another principal sales or service activity, and is further aggravated when the empty bottle storage facility is unattended or not subjected to surveillance by the vendor or his agents for prolonged periods. Exemplary of such situations wherein soft drink vendors are presently plagued by empty bottle thievery is the provision of coin-operated bottled soft drink vending machines and containers or receptacles for empty bottles at gasoline service or filling stations. Such vending operation is to a large extent offered as a convenience to customers, and is not the principal business of the station operator. Regrettably, quite often at such service stations it is unavoidable that the vending machines and the empty bottle containers are disposed outside and must remain outside the building or any other structure that can be locked during hours that the station is closed. This is doubly regrettable in that such an arrangement frequently results in substantial bottle losses by reason of theft, and in that temptation to thievery exists sufficient to cause initial criminal ventures by youngsters and the sad consequences that all too often follow such initial criminal ventures.

Although the paramount objective of the present invention is to prevent or greatly attenuate pilferage of empty bottles as outlined above, another very important object of the invention in accordance with such paramount objective is to provide a pilferage resistant receptacle that is capable of handling a wide variety of the different sizes and shapes of conventional bottles in which soft drinks are bottled, whether such bottles all be of one type, predominantly one type, or mixed.

Still another very important object of the invention in accordance with the preceding objects is to provide a pilferage resistant receptacle such that it is not only virtu-

ally impossible to jam in an attempt to overfill the same, but which will afford a visual indication that the storage capacity is exhausted, such indication being offered with respect to each and every storage compartment of the receptacle when a plurality of such compartments is provided.

Still another object of the invention is to provide a receptacle of the character described such that liquids or condensation spilled or formed within the receptacle may be readily drained or cleaned therefrom, whereby corrosion can be limited and whereas health hazards and odorous conditions can be avoided and/or speedily corrected.

Still another important object of the invention is to provide convenient access for authorized personnel to any and all storage compartments within the receptacle through the use of a single lock and hinged door or wall.

Another important object of the invention is to provide a receptacle capable of realizing the objects set forth above that is simple and susceptible to economic manufacturing techniques, and which may be easily transported and installed at a position of use, and which may be easily repaired by persons of modest mechanical technical ability.

A final important object of the invention to be specifically enumerated herein resides in the provision of a receptacle of the class described such that the lock controlled access means permitting removal of empty bottles from the receptacle also exposes for convenient access the working parts of the structure whereby such repairs as may be necessary may be conveniently effected.

Broadly, the receptacle of this invention involves a receptacle having a bottle receiving opening through which empty bottles may be inserted onto an inclined tray upon which the bottles roll to a position of rest or storage along a predetermined travel path within the receptacle, together with interconnected means for alternately obstructing the travel path and the bottle receiving opening, whereby the bottle receiving opening is always closed or obstructed whenever the travel path within the receptacle is unobstructed (and vice versa), so that a bottle cannot be caused to move reversely along the travel path from its position of rest or storage by means extending through the bottle receiving opening. Such interconnected means obviously prevents a person using his hand to cause reverse movement of a bottle from its storage position along the travel path by insertion of his arm through the closed or obstructed bottle receiving opening.

Still another important aspect of the invention involves the travel path obstructing means being so situated that when the storage capacity of the receptacle associated with such travel path is exhausted, the travel path obstructing means is prevented from moving to its unobstructing position, whereby the interconnected means obstructs or closes the bottle receiving opening to thereby afford a visual indication that the storage capacity of the receptacle associated with such bottle receiving opening is exhausted.

An aspect of the invention involves in a pilferage resistant receptacle for empty soft drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in a cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from the first side wall to the second side wall in an arrangement such that a rolling travel path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll by gravity to the second side wall, and interconnected means for alternately obstructing said travel path and said opening. More specifically, such interconnected means comprises gate means for selectively obstructing said

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travel path, barrier means for selectively obstructing said opening, and means operatively interconnecting said gate means and said barrier means for alternative selective operation of said gate means in said barrier means.

With greater particularity, the aspect of the invention described in the preceding paragraph encompasses the gate means including a gate movable into and out of travel path obstructing position, said gate means being responsive to force directed against the gate along the travel path toward the second side wall when the gate is in said obstructing position to move the gate out of the obstructing position.

Yet another important aspect of the invention comprises the provision of two sets of independently operating interconnected means for alternately obstructing the travel path and the bottle receiving opening, whereby proper operation insofar as obstructing the travel path is assured despite bottles of widely differing characteristics as to variation of radius with the lengths thereof.

The invention involves a storage cabinet or receptacle for empty soft drink bottles comprising a rectangular cabinet including vertical front and rear walls connected by vertical first and second side walls, a plurality of vertically spaced, substantially parallel bottle support trays mounted in the cabinet to define a vertical series of bottle storage compartments, said trays being downwardly inclined from the first side wall to the second side wall to define within each compartment a sloping travel path adapted for the gravity rolling of bottles from the first side wall to the second side wall, said front wall being provided with a vertical series of openings adjacent the first side wall and substantially spaced from the second side wall, with each of said openings communicating with one of said compartments, each of said compartments being separately provided with interconnecting means for alternately obstructing the travel path in the opening associated with such compartment, said interconnecting means including a gate for obstructing the travel path pivotally mounted to swing from a normal obstructing position to an unobstructing position, means yieldingly urging said gate into the obstructing position and against the gravity rolling passage of a bottle thereby, whereby bottles may be sequentially inserted into one of said compartments through the opening associated therewith, with each bottle rolling by gravity by the gate to substantially fill the compartment and until a bottle cannot clear the gate sufficiently for the latter to return to its normal obstructing position after which the opening remains obstructed to prevent insertion of additional bottles to such individual compartment, and one of said walls being hingedly mounted for opening the cabinet and authorized bottle removal.

According to the preferred form of the invention, the interconnected means specified above involves a shaft mounted for rocking between first and second positions, together with a gate fixed on the shaft as well as a barrier fixed on the shaft, whereby each interconnected means may in its simplest form comprise a single moving part.

Other objects and aspects of the invention will become apparent during the following description of a preferred embodiment of the invention taken in conjunction with the accompanying drawings illustrative of such embodiment, wherein:

FIGURE 1 is a perspective view of the storage cabinet or receptacle with outer portions being shown broken away to reveal the interior thereof;

FIGURE 2 is a front elevational view of the cabinet with the upper and lower portions of the front wall or door being shown broken away to reveal, respectively, an upper compartment and the drain tray;

FIGURE 3 is a side elevational view of the structure shown in FIGURE 2, the view being taken from the right hand side of FIGURE 2 and showing a part of the interior of the cabinet with the adjacent side wall partially broken away;

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FIGURE 4 is an enlarged fragmentary front elevational view illustrating relative positions occupied by the interconnected means with respect to full and less than full storage compartments;

FIGURE 5 is an enlarged fragmentary perspective view of an interconnected means and its relationship to the tray with which it is associated;

FIGURE 6 is an enlarged fragmentary perspective view of the stop means provided for limiting the oscillatory or rocking movement of each of the interconnected means;

FIGURE 7 is an enlarged fragmentary front elevational view of dual interconnecting means provided for use in connection with a single tray;

FIGURE 8 is a top elevational view of a single tray for a compartment filled with empty bottles, such tray being provided with dual interconnecting means such as shown in FIGURE 7; and,

FIGURE 9 is a perspective view of a single tray provided with dual interconnected means such as shown in FIGURES 7 and 8, such interconnected means being shown in the travel path obstructing position.

It is to be emphasized at the outset that the preferred embodiment of the invention illustrated in the drawings briefly described above is to be considered as exemplary of the invention, and that notwithstanding the rather detailed description of such embodiment hereinafter presented to convey a full and complete understanding of the principles involved, no narrowness or restriction in scope of the invention is to be inferred by such detailed description, but rather the actual scope of the invention is to be measured by the claims appended to this specification.

Referring to the drawings, wherein like numerals designate like parts throughout the various figures, the reference numeral **10** designates generally the storage receptacle or cabinet of the invention, the same comprising rectangular and horizontal top and bottom walls **12** and **14** respectively, rigidly connected to a vertical rear wall **16** and to vertical and parallel side walls **18** and **20**. The rear edges of the side walls **18** and **20** are rigidly attached to the lateral edges of the rear wall **16**. Though not shown, the bottom wall **14** can be provided with support legs or casters for supporting the cabinet **10** in a conventional manner. Preferably, however, means is provided whereby the cabinet **10** can be laterally supported by or on a vertical wall or a side of a vending machine. Such means comprises providing each of the walls **16**, **18** and **20** with sets of keyhole openings through which projecting headed support posts or studs (not shown) fixed to the supporting wall or vending machine can extend to support the cabinet **10**. The keyhole openings such as are provided in the walls **16**, **18** and **20**, whereby any one of such walls can be seated flush against the supporting wall or vending machine are clearly shown in connection with the wall **18** and are designated by the reference numerals **22**, **24**, **26**, **28** and **30**. It will be clearly understood that corresponding sets of keyhole-shaped openings are provided in the walls **16** and **20**, and it will be noted that openings **32** and **34** of such sets are exposed in FIGURE 1.

The cabinet structure **10** also includes a front wall **36** hingedly connected by a vertically extending piano-type hinge **38** to the forward vertical edge of the side wall **20**, whereby the front wall **36** constitutes a door for the cabinet **10**. In the normally closed position of the front wall or door **36** shown in FIGURE 1, it will be seen that the same is parallel to the rear wall **16** and extends between the forward edges of the side walls **18** and **20** and between the forward edges of the top and bottom walls **12** and **14**. Means is provided for locking the front wall **36** in the closed position which comprises a U-shaped member or loop **40** rigidly secured to the wall **18** in a position to project through a slot **42** in the front wall or door

36 when the latter is in its closed position. The arrangement is such that when the front wall or door 36 is closed a padlock 44 can be secured through the loop 40 to prevent the door 36 being opened by unauthorized persons, namely, those not having a key to or having knowledge of the combination of the padlock 44.

The interior of the cabinet or receptacle 10 is divided into a vertical array of separate storage compartments such as those indicated at 50, 52 and 54 by a vertical series of spaced partitions or trays such as those indicated at 56 and 58 underlying compartments 50 and 52 respectively. The trays provided are spaced along throughout almost the entire vertical height of the cabinet 10, and except to the extent that differing types of interconnected means hereinafter described may be applied to different trays, such trays are identical to each other, and are substantially parallel to each other. Each of the trays, such as the tray 60 shown in FIGURE 5, is substantially planar and is disposed so that a perpendicular thereto and upstanding therefrom is inclined rearwardly toward the rear wall 16 and also laterally toward the side wall 20. In other words, the upper generally planar surface of the tray 60 slopes downward from the front wall 36 toward the rear wall 16 and also slopes downward from the side wall 18 toward the side wall 20. The lowermost corner of the tray 60 (as well as the lowermost corners of all the trays) is cut away as indicated at 62, whereby liquids draining from the upper surface of the tray 60 may drain downwardly through the cabinet 10 adjacent the juncture of the rear wall 16 and the side wall 20. It will be noted that such drainage is afforded even though the lateral edges of the tray 60 are, as is preferred, fixedly secured by any suitable means to the rear wall 16 and the side wall 20.

In the preferred construction all of the trays are upturned along a smooth arc adjacent the side wall 18, such construction being clearly shown at 64 in connection with the illustration of tray 60 in FIGURE 5. For a reason subsequently to become apparent, the radius of curvature of the upturned marginal portion 64 of the tray 60 is approximately that of the radii of empty bottles to be stored in the cabinet or receptacle 10. The lateral extremity of the upturned marginal portion 64 of the tray 60 is substantially vertical and is seated flush against the side wall 18, and is suitably secured thereto as by spot welding or the like. Also in the preferred construction, the rear and side edges of the tray 60 that are disposed adjacent the rear and side walls 16 and 20 are provided with depending flanges 66 and 68 respectively that can be spot welded to the rear and side walls 16 and 20.

The front wall or door 36 of the cabinet 10 is provided with a vertical series of spaced circular openings such as those indicated at 70 and 72. The vertical series of openings in the front wall 36 correspond in number and spacing to the trays within the cabinet 10. In other words, there is with respect to each of the trays an opening in the front wall 36 disposed adjacent the side wall 18, the lower portion of which is adjacent the upper surface of the tray so as to afford communication through such opening with the interior of the compartment, the bottom of which is defined by such tray. The openings in the front wall 36 are as previously mentioned preferably circular and have a diameter sufficiently large to accommodate endwise insertion therethrough of empty bottles to be stored in the cabinet 10, and the diameter of such openings is less than the vertical spacing between adjacent trays.

As thus far described, it will be evident that an empty bottle may be inserted lengthwise through any of the openings in the front wall 36 so as to be positioned on the tray immediately below such opening with such bottle having its longitudinal axis generally parallel to the sidewall 18. With the bottle so positioned on the tray, the previously described sloping character of the tray together with the upward curvature of the tray adjacent

the side wall 18 causes the bottle to roll upon the surface of the tray toward the side wall 20 with the axis of the bottle remaining generally parallel to the side wall 18. In the event that no bottles have already been disposed in such compartment, the bottle will roll as described until it rests against the side wall 20 with the axis thereof generally parallel to the side wall 18. A second bottle similarly inserted into such compartment will roll along the travel path afforded therefor by the tray until the same comes to rest against the previously stored bottle in substantial parallelism therewith. Four bottles 80, 82, 84 and 86 are illustrated in FIGURE 1, as being stored in the compartment 50 in the manner thus described. It should be understood that while it is preferred that the trays slope downwardly and rearwardly as well as downwardly to the side, such preferred style of construction is not essential and in any event such rearward sloping should not be so great that engagement of the bottles with the rear wall 16 will seriously interfere with the rolling of the bottles along the defined travel path. Such downward and rearward sloping of the trays as is preferred is for the purpose of making the insertion of bottles into the compartments through the openings in the front wall 36 easier and for the additional purpose of expediting drainage of liquids from the trays and downwardly through the cabinet 10 in the event of spillage of liquids or the condensation of moisture within the cabinet 10. It will also be noted that when the cabinet 10 is emptied of bottles and the front wall or door 36 is opened that the interior of the cabinet including the top and bottom surfaces of the trays 10 can be easily hosed with water with rapid drainage for reasons of sanitation.

Means is provided for collecting for convenient disposal liquids draining downwardly through the cabinet 10 as well as bits of glass or other debris such as may be occasioned by bottle breakage or the like. Such means comprise the provision of a drawer 90 slidably received within the bottom of the cabinet 10 on the bottom wall 14 and below the lowermost tray 92. The drawer 90 is simple in construction and is comprised simply of a liquid tight, open topped pan provided with a pull 64 on the front side thereof by means of which the drawer or pan 90 can be removed from and inserted into the cabinet 10 when the front wall or door 36 is open. Parallel horizontal guide rails are fixed to the side walls 18 and 20 at positions immediately above the sides of the drawer 90 so as to slidably retain the drawer 90 against the bottom wall 14, the guide rail secured to the side wall 18 being clearly shown at 96 in FIGURE 2. If deemed necessary or expedient, additional guide rails, not shown, can be secured to the side walls 18 and 20 to slidably support the lateral edges of the drawer 90 as will be apparent to those skilled in the art. In the preferred construction, the drawer or pan 90 is of such size as to fit snugly against the side walls 18 and 20 and the rear wall 16 when the drawer or pan 90 is positioned within the cabinet 10. This is so that liquids draining downwardly through the cabinet adjacent the juncture of the side wall 20 and the rear wall 16 will drain into the drawer or pan 90. Though not illustrated, it is deemed well within the capacities of those having only a modest familiarity with the art to provide flexible seals about the upper peripheral edges of the drawer or pan 90, or to provide an internal gutter at the juncture of the side wall 20 and the rear wall 16 arranged to drain into the drawer or pan 90.

As thus far described and as previously indicated, the trays within the cabinet 10 are all identical and spaced in general parallelism to each other so that they all slope downwardly from the side wall 18 toward the side wall 20. Preferably also, though not absolutely essential, the trays are inclined downwardly from the front wall 36 to the rear wall 16. The trays differ from each other only to the extent occasioned by differences in the interconnected means that may be associated with the individual trays.

FIGURES 1 through 6 illustrate one of the preferred forms of interconnected means employed in association with the trays. Such interconnected means provided in association with each tray is such as to alternately obstruct the travel path along which a bottle rolls on such tray and the opening in the front wall or door 36 through which bottles are inserted into the cabinet onto such tray. The character of the interconnected means can be best appreciated upon reference to FIGURES 5 and 6, wherein it will be seen that such means designated generally at 100 comprises a rock shaft 102 disposed below the tray 60 and journaled for rocking movement about its longitudinal axis through aligned openings in downwardly struck tabs or ears 104, 106 and 108 integral with the tray 60. The orientation of the rock shaft 102 with respect to the tray 60 and the cabinet 10 within which the tray 60 is disposed is such that the shaft 102 is parallel to the side wall 18, and inasmuch as the tray 60 slopes downwardly from the front wall 36 to the rear wall 16 only to a modest extent, the shaft 102 can if desired be parallel to the tray 60 and yet be substantially perpendicular to the front wall 36. Inasmuch as it is preferred that the rock shaft 102 be essentially perpendicular to the front wall 36, the tabs 104, 106 and 108 can if deemed necessary or expedient depend progressively greater distances below the tray 60 so that the aligned openings and the shaft 102 extending through such openings may be horizontal as well as parallel to the side wall 18 so as to be perpendicular to the front wall 36.

It is clearly shown in FIGURES 5 and 6 that the tab 108 is rearwardly offset from the marginal flange or edge 110 of the tray 60, it being understood that the flanged edge 110 of the tray 60 is disposed so as to abut the front wall 36 when the latter is in its closed position. Not only is the tab 108 spaced from the flanged front edge 110 of the tray 60, but the front edge 112 of the tray 60 intermediate the tab 108 and the side wall 18 is also spaced from and in parallel relation to the front wall 36 to afford space for a barrier 114 that is normally disposed in the plane of the tray 60 and intermediate the openings in the front wall 36 immediately above and below the tray 60. The end of the rock shaft 102 adjacent the front wall 36 is bent at right angles as shown at 116, and the angled portion 118 thereof is fixedly secured to the barrier 114. With the barrier 114 in the normal position shown thereof in FIGURES 5 and 6, it will be noted that the right angled portion 118 of the shaft 102 is generally horizontal and prevents anticlockwise rotation of the shaft 102 as viewed in FIGURES 5 and 6 by engaging a stop 120 carried by the lower end of the tab 108.

The barrier 114 extends generally in the direction of the shaft portion 118, and may be a plastic body securely molded on the free end of the shaft portion 118. In any event, the upper and lower configuration of the barrier 114 is such that the same does not substantially obstruct either of the openings in the front wall 36 immediately above and below the tray 60, and for this purpose it is most convenient that the barrier 114 have a rather large rounded end 122 and upper and lower concaved surfaces 124 and 126, it being noted that the concaved surfaces 124 and 126 are generally conformable to the openings immediately above and immediately below the tray 60 when the shaft portion 118 is seated against the stop 120.

As will be appreciated on reference to FIGURES 5 and 6, the shaft 102 can be rocked in a clockwise direction as viewed in such figures so that the barrier 114 moved upwardly from a position in which the same does not obstruct the opening in the front wall 36 immediately above the tray 60 to a position such that the barrier 114 effectively closes or substantially obstructs the opening in the front wall 36 immediately above the tray 60. In other words, by suitable rocking motion of the shaft 102, the barrier 114 can be selectively positioned in either an

obstructing or an unobstructing position with respect to the opening immediately above the tray 60.

The interconnected means 100 further includes a gate means for selectively obstructing the travel path of bottles in a direction opposite to that along which they roll from adjacent the side wall 18 toward the side wall 20. Such gate means is designated generally at 130 and includes a pair of openings 132 and 134 in the tray 60, it being noted that the openings 132 and 134 can be most conveniently formed in the striking downwardly of the tabs 104 and 106. The end of the shaft 102 remote from the barrier 114 is bent from about 50° to about 130° at right angles as shown to the axis of the shaft 102 so as to extend upwardly through the opening 132 as a gate arm 140 for a substantial interval above the surface of the tray 60 when the shaft portion 118 is resting against the stop 120. The gate arm 140 is inclined upwardly toward the side wall 20 at an acute angle from about 25° to about 65° with respect to the horizontal, and preferably about 45°. A second gate arm 142 is provided that has one end fixedly secured to the shaft 102 as by welding or the like at an angle from about 50° to about 130°. The gate arm 142 is preferably about the same length as the arm 140 and is preferably though not necessarily parallel thereto. Adjacent their upper or outer ends, the arms 140 and 142 are preferably connected by a rod 144 extending therebetween and having its opposite ends welded thereto. The upper surface of the tray 60 is provided with an H-shaped pattern of indentation 146 adapted to receive the arms 140 and 142 as well as the rod 144 when the rock shaft 102 is rotated clockwise to a sufficient extent to move the barrier 114 into its opening obstructing position, it being understood that the indentations 146 are of sufficient depth that the arms 140 and 142 and the rod 144 are, when the barrier 114 is in opening obstructing position, effectively below the surface of the tray 60, and it will also be noted that the engagement of the arms 140 and 142 with the bottom of the indentations 146 limits clockwise rotation of the shaft 102 to such an extent that the barrier 114 will not move upwardly beyond the position substantially centered with respect to the opening in the front wall 36 immediately above the tray 60.

As thus far described, it will be seen that the interconnected means 100 can be disposed in two selective positions, namely, the position shown in FIGURE 5 wherein the barrier 114 does not obstruct any of the openings in the front wall 36 at which time the gate means 130 is disposed in a position such as to obstruct the travel path above the tray 60 in such a manner that a bottle cannot be moved in a direction opposite that from which it rolls from the side wall 18 to the side wall 20 and in particular so that a bottle cannot be moved from a position opposite the gate means 130 from the side wall 18 to a position in alignment with the opening immediately above the tray 60 (in this regard the upper ends of the arms 140 and 142 are so closely spaced to the tray immediately above the tray 60 to prevent passing the bottle above the gate means 130, and the arms 140 and 142 are spaced sufficiently far apart or close to the rear wall 16 and the front wall 36 so as to prevent a bottle being passed around the ends of the gate means 130); and the alternate selective position wherein the barrier 114 obstructs the opening in the front wall 36 immediately above the tray 60 in which case the gate means 130 is disposed below the upper surface of the tray 60 so as to not obstruct the travel path.

The center of gravity of the interconnected means 100 is such that except for the application of external force to such interconnected means, the same occupies the position shown thereof in FIGURES 5 and 6, this being a consequence of the weight of the barrier 114 being such as to impose a counterclockwise torque to the shaft 102 greater than the clockwise torque resulting from the weight of the gate means 130. While the balance of

the interconnected means 100 is such that the same occupies the position shown thereof in FIGURES 5 and 6, the net torque upon the shaft 102 favoring counter-clockwise rotation of the shaft 102 is less than that required considering the inclined slope of the gate arms 140 and 142 to prevent a bottle rolling over the gate means 130 under the influence of gravity from adjacent the side wall 18 and on toward the side wall 20. In such case, the action is such that a bottle will roll by gravity over the gate means 130 during which time the barrier 114 is raised to opening obstructing position, and after the bottle has rolled toward the wall 20 to an extent sufficient to clear the gate means 130, the gate means 130 rises (by virtue of the weight of the barrier 114) and the barrier 114 returns to the position shown thereof in FIGURES 5 and 6. The bottle is then free to progress by gravity and roll until it engages the wall 20 or a bottle previously disposed on the tray 60.

Eventually, the tray 60 becomes sufficiently filled with bottles that the subsequent positioning of another bottle thereon results in a bottle rolling upon the gate means 130 so as to depress the latter and is prevented from clearing the gate means 130 by engaging previously introduced bottles, with the result that the barrier 114 remains in its raised and opening obstructing position. As indicated in the drawings, the side of the barrier 114 facing toward the front wall 36 is provided with the printed legend thereon of "full," whereby a visual indication is afforded that is viewable through the opening that the tray associated with such opening is in a full condition.

This latter mentioned condition will be best appreciated upon reference to FIGURE 4 wherein a tray 150 has been filled by bottles such as the one indicated at 152, the bottle 152 resting upon the gate means indicated by the dashed representation of the gate arm 142. Not only does the bottle 152 hold the barrier 114 in bottle receiving opening obstructing position, but it is especially important to note that downward force exerted on the barrier 114 through the bottle receiving opening will either not result in or at least make it very difficult to effect leftward movement of the bottle 152 as viewed in FIGURE 4 into position of alignment with the bottle receiving opening. Such difficulty or impossibility occurs by virtue of such downward force on the barrier 114 serving only to raise the bottle 152 by the gate means 132 into a jamming position against the underside of the tray 154 immediately overlying the tray 150.

Not only is it therefore extremely difficult if not impossible to remove a bottle from a filled tray, it is also impossible or extremely difficult to remove a bottle from a partially filled tray. This latter consideration will be apparent on further consideration of FIGURE 4 in relation to the tray 154 shown as partially filled and having a bottle thereon such as the partially illustrated bottle 156. While it may be possible to extend an arm through the opening in the front wall 36 immediately overlying the tray 154 so as to reach the bottle 156 with the hand, such bottle 156 cannot be moved to the left by the gate means 130 as is necessary in order to withdraw the bottle 156 through the bottle receiving opening without the barrier 114 being forced to move into the position thereof that obstructs the bottle receiving opening.

FIGURE 1 perhaps affords the best indication of the relationship of the barriers of various interconnected means to their respective bottle receiving openings in the front wall 36. The tray 50 is shown as filled by the bottles 80, 82, 84 and 86 with the bottle 80 coacting with the interconnected means of the tray 50 to place the barrier 160 of such particular interconnected means in bottle receiving opening obstructing position. The reference numeral 162 also designates a barrier disposed in position obstructing the opening 72 in the front wall 36 affording visual indication that the tray associated with the opening 72 is filled. The reference numeral 164 shows a barrier

associated with the tray 52 that is disposed in a position that does not obstruct any of the openings in the front wall 36, whereby the opening immediately above and associated with the tray 52 is unobstructed an empty bottle may be inserted into the cabinet 10 and disposed on the tray 52.

Inasmuch as it is very desirable that the storage cabinet or receptacle 10 include storage capabilities for various sized bottles, as well as of bottles that may vary substantially in diameter along their axial lengths, it is within the scope of this invention that some of the trays be spaced a greater distance apart than are the others and that such trays be provided with correspondingly larger sized bottle receiving openings and interconnected means. Such variation or departure from exact uniformity as to size of tray spacings, bottle receiving openings and interconnected means is deemed clearly within the skill of the art, and illustration and detailed discussion of such possible variations are unnecessary and would only tend to obscure the principles of the invention. While it is not deemed necessary to illustrate or describe size variations that may be made with respect to various storage compartments in the cabinet 10, it may be deemed necessary or expedient to provide some of the trays with interconnected means specially adapted to coact with bottles that vary substantially in their diameters along their axial lengths, and since such special provision is most definitely not within the skill of the art, attention is directed to FIGURES 7 through 9 wherein such specially provided interconnected means are illustrated.

Such specially provided interconnected means is designated generally at 200 and is shown in relation to a tray 202 that is generally similar to the previously described tray 60. The interconnected means 200 comprises a pair of parallel shafts 204 and 206 that are parallel to each other and disposed below the tray 202. The rock shaft 204 is journaled through tabs 208, 210 and 212 integral with and extending below the tray 202. The shaft 206 is journaled through the tabs 210 and 212. The tray 202 is provided with an opening 214 and a depression 216 to accommodate a gate arm 218 fixed to the end of the shaft 204 adjacent the rear wall 16. Similarly, the tray 204 is provided with an opening 220 and a depression 222 to accommodate a gate arm 224.

The shafts 204 and 206 can be rocked independently so that the gate arms 218 and 224 fixed thereto can each be selectively disposed in a travel path obstructing position and a position disposed out of the travel path. The ends of the shafts 204 and 206 nearest the front wall 36 are provided with barriers 226 and 228, respectively, such barriers 226 and 228 being forwardly and rearwardly spaced from each other by virtue of the shaft 206 projecting to a greater extent toward the front wall 36 of the cabinet 10. Anticlockwise rotation of the shafts 204 and 206 is limited by a stop 230 fixed on the tab 212, it being understood that when the barriers 226 and 228 are in such limited position that they do not obstruct openings in the front wall 36 either immediately above or immediately below the tray 202.

As thus far described, it will be appreciated that the interconnected means 200 constitutes in a very large sense the provision of two pairs of interconnected means quite similar to the previously described interconnected means 100. Rather than constituting merely a duplication, the arrangement is such that the coaction between the interconnected means 200 and a bottle of irregular diameter along its length is such that the bottle is least likely to be turned into a position causing the axis thereof to depart substantially from parallelism with the side wall 18 and a rolling thereof in a direction that departs substantially from directly toward the side wall 20. In short, the resistance afforded to the rolling of a bottle over the gate means (arms 218 and 224) is more uniformly distributed along the length of the bottle than would be the case if the arms 218 and 224 were rigidly connected and only

one of such arms were in engagement with the bottle. It is not believed necessary to explain further the operation of the interconnected means 200 in view of the previous explanation of the operation of the interconnected means 100 other than to emphasize that the position shown by such means in FIGURE 9 is the rest position thereof except when external forces applied thereto. It will suffice to consider the special advantage of the dual type interconnected means 200 to make reference to FIGURES 7 and 8 wherein the complete or substantially complete actuation of one of the barriers 226 and 228 is virtually assured so as to block or obstruct a bottle receiving opening even when the bottles are of the narrow waist or conversely the bulging waist type.

Inasmuch as the provision of interconnected means 200 is somewhat more costly than that of interconnected means 100, the employment of interconnected means 200 can be reserved for use with trays having associated receiving openings bearing a legend printed on the front wall 36 directing the deposit in such opening of empty bottles of brand names associated with bottles of such special character.

The walls of the cabinet 10 and the trays within the cabinet 10 can be conveniently made of sheet metal such as 18-gauge steel sheet, and can be painted or otherwise surface treated to afford resistance to corrosion as desired. The barriers of the various type of connecting means are preferably plastic though they can be made of metal if desired, with the balance of the interconnected means, namely, the rock shafts and the gate arms being made of steel rod stock.

While it is usually preferable that the shaft 102 be generally parallel to the side wall 18 as shown in the drawings, this is not essential and if desired the shaft 102 can be inclined rearwardly toward the side wall 18 so that the gate means 130 can be closer spaced to the wall 18 and the bottle capacity of the device increased somewhat. Such inclination should be limited to such an extent that the shaft 102 will not depart from being perpendicular to the front wall 36 by more than about 15°. In the appended claims, expressions such as ". . . substantially horizontal shaft in the cabinet generally parallel to and spaced from the first side wall . . ." are to be interpreted as of such breadth as to include such minor variations in the orientation of the shaft 102.

Having described the invention in elaborate detail so as to convey a full and complete understanding of the principles therein involved, so that the benefits of the practice of the invention can be readily obtained, attention is now directed to the appended claims from which the actual slope of the invention can be determined, it being important to note that the illustrated embodiment of the invention is susceptible to numerous variations in detail without departing from the spirit of the invention.

We claim:

1. In a pilferage resistant receptacle for empty soft-drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from the first side wall to the second side wall in an arrangement such that a rolling travel path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll by gravity to the second side wall, and movable mechanical means extending between positions adjacent the opening and the travel path for selective and alternative obstruction of the opening and the travel path.

2. In a pilferage resistant receptacle for empty soft-drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided

with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from a first side wall to the second side wall in an arrangement such that a rolling travel path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll by gravity to the second side wall, gate means for selectively obstructing said travel path, barrier means for selectively obstructing said opening, and means operatively interconnecting said gate means and said barrier means for alternative selective operation of said gate means and said barrier means.

3. In a pilferage resistant receptacle for empty soft-drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from a first side wall to the second side wall in an arrangement such that a rolling travel path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll by gravity to the second side wall, gate means for selectively obstructing said travel path, barrier means for selectively obstructing said opening, and means operatively interconnecting said gate means and said barrier means for alternative selective operation of said gate means and said barrier means, said gate means including a gate movable into and out of a travel path obstructing position, said gate means being responsive to force directed against the gate along the travel path toward the second side wall when the gate is in said obstructing position to move the gate out of the obstructing position.

4. The combination of claim 3, wherein said gate is pivotally mounted to move from said obstructing position toward said second side wall and out of the travel path, and a stop means limiting pivotal movement of the gate from said obstructing position toward the first side wall.

5. In a pilferage resistant receptacle for empty soft-drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from the first side wall to the second side wall in an arrangement such that a rolling travel path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll back by gravity to the second side wall, a substantially horizontal shaft in the cabinet generally parallel to and spaced from the first side wall, said shaft being mounted to rock about its axis between the first and second positions, a gate mounted on the shaft, said gate being respectively in and out of the travel path when the shaft is in its first and second positions, a barrier selectively movable into and out of a position obstructing the opening, and means operatively interconnecting the shaft and the barrier to selectively move the barrier into its opening obstructing position solely when the shaft is in its second position.

6. In a pilferage resistant receptacle for empty soft-drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from the first side wall to the second side wall in an arrangement such that a rolling travel path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll by gravity to the second side wall, a substantially horizontal shaft in the cabinet generally parallel to and spaced from the first side wall, said shaft being disposed in close proximity to the tray and mounted to rock about its axis intermediate first

and second positions, a gate mounted on the shaft and disposed to extend upwardly and into the travel path when the shaft is in its first position and in a reclined position substantially clear of the travel path and extending toward the second side wall, a barrier mounted on the shaft and extending toward the first side wall and disposed in the position obstructing said opening solely when the shaft is in its second position.

7. The combination of claim 6, wherein means is provided to limit rocking movement of the shaft toward the first position thereof, and means for biasing rocking movement of the shaft toward the first position thereof.

8. In a pilferage resistant receptacle for empty soft-drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from the first side wall to the second side wall in an arrangement such that a rolling path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll by gravity to the second side wall, a pair of parallel, substantially horizontal shafts in the cabinet generally parallel to and spaced from the first side wall, said shafts being disposed in close proximity to the tray with each of said shafts being mounted to rock intermediate first and second positions, a gate mounted on each of the shafts and disposed to extend upwardly and into the travel path solely upon its respective shaft being in the first position thereof, said gates being spaced from each other along the direction of the shafts, and a barrier mounted on each of the shafts, with each barrier being disposed in a position to obstruct said opening solely when its respective shaft is in its second position, said barriers being spaced from each other in a direction parallel to said shafts.

9. In a pilferage resistant receptacle for empty soft-drink bottles having a predetermined maximum diameter, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said opening being sufficiently larger in size than a circle of said predetermined diameter to permit a bottle to be inserted endwise into the cabinet and on to the tray, said tray being inclined downwardly from the first side wall to the second side wall to define a rolling travel path on the tray whereby a bottle resting on the tray in endwise alignment with the opening will roll by gravity to the second side wall, interconnected means for alternately obstructing said travel path and said opening, said last means including a gate pivotally mounted on the cabinet, said gate having a generally horizontal axis in proximity to the tray and generally parallel to the first side wall, said pivotal axis being intermediate the opening and the second side wall being spaced from the second side wall, and said gate being in a first position projecting upwardly into the travel path from the top of the tray when said interconnected means obstructs said travel path and being pivotally movable about said pivotal axis toward the second side wall to a second position substantially coincident with the top of the tray and underlying the travel path when said interconnecting means obstructs the opening.

10. In a pilferage resistant receptacle for empty soft-drink bottles having a predetermined maximum diameter, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said opening being sufficiently larger in size than a circle of said predetermined diameter to permit a bottle

to be inserted endwise into the cabinet and on to the tray, said tray being inclined downwardly from the first side wall to the second side wall to define a rolling travel path on the tray whereby a bottle resting on the tray in endwise alignment with the opening will roll by gravity to the second side wall, interconnected means for alternately obstructing said travel path and said opening, said last means including a gate pivotally mounted on the cabinet, said gate having a generally horizontal axis in proximity to the tray and generally parallel to the first side wall, said pivotal axis being intermediate the opening and the second side wall being spaced from the second side wall, and said gate being in a first position projecting upwardly into the travel path from the top of the tray when said interconnected means obstructs said travel path and being pivotally movable about said pivotal axis toward the second side wall to a second position substantially coincident with the top of the tray and underlying the travel path when said interconnecting means obstructs said opening, said gate being inclined downwardly toward the second side wall when the gate is in said second position, and limit means spaced above the gate for preventing pivotal movement of the gate from the second position thereof to substantial downward inclination toward the first side wall when a bottle of said predetermined diameter is interposed between such limit means and said gate.

11. The combination of claim 10, including a second interconnected means for alternately obstructing said travel path and said opening, said second interconnected means including a second gate pivotally mounted independently of the first-mentioned gate.

12. The combination of claim 10, wherein said limit means is constituted of a second bottle support tray mounted in the cabinet above and in substantial parallelism to the first-mentioned tray.

13. The combination of claim 10, wherein said tray is inclined downwardly from the front wall toward the rear wall.

14. The combination of claim 13, including a vertical passageway adjacent the juncture of the tray, the second side wall and the rear wall for draining liquid from the top of the tray to below the tray.

15. The combination of claim 10, wherein one of said walls is hingedly connected to the other walls to constitute a door to afford access to a bottle resting on the tray remote from the first side wall, and means for securing the hingedly mounted wall to the other walls in a normal position closing the cabinet.

16. The combination of claim 15, wherein said one wall is the front wall.

17. A storage cabinet for empty soft-drink bottles comprising a rectangular cabinet including vertical front and rear walls connected by vertical first and second side walls, a plurality of vertically spaced, substantially parallel bottle support trays mounted in the cabinet to define a vertical series of bottle storage compartments, said trays being downwardly inclined from the first side wall to the second side wall to define within each compartment a sloping travel path adapted for the gravity rolling of bottles from the first side wall to the second side wall, said front wall being provided with a vertical series of openings adjacent the first side wall and substantially spaced from the second side wall, with each of said openings communicating with one of said compartments, each of said compartments being separately provided with interconnecting means for alternatively obstructing the travel path and the opening associated with such compartment, said interconnecting means including a gate for obstructing the travel path pivotally mounted to swing from a normal obstructing position to an unobstructing position, means yielding urging said gate into the obstructing position and against the gravity rolling passage of a bottle thereby, whereby bottles may be sequentially inserted into one of said compartments through the opening asso-

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ciated therewith, with each bottle rolling by gravity by the gate to substantially fill the compartment and until a bottle cannot clear the gate sufficiently for the latter to return to its normal obstructing position after which the opening remains obstructed to prevent insertion of additional bottles in such individual compartment, and one of said walls being hingedly mounted for opening the cabinet and authorized bottle removal.

18. In a pilferage resistant receptacle for empty soft-drink bottles, structure comprising an upstanding cabinet including vertical front and rear walls connected by vertical first and second side walls, a bottle support tray mounted in the cabinet, said front wall being provided with an opening therethrough above the tray and adjacent the first side wall, said tray being inclined downward from the first side wall to the second side wall in an arrangement such that a rolling travel path on the tray is defined whereby a bottle resting on the tray in alignment with the opening will roll by gravity to the second side wall, a substantially horizontal shaft in the cabinet generally parallel to and spaced from the first side wall, said shaft being disposed in close proximity to the tray and mounted to rock about its axis intermediate first and second positions, a gate mounted on the shaft and disposed to extend upwardly and into the travel path when the shaft is in its first position and in a reclined position substantially clear of the travel path and extending toward the second side wall, a barrier mounted on the shaft and extending toward the first side wall and disposed in the position obstructing said opening solely when the shaft is in its second position, means for limiting rocking movement of the shaft toward the first position thereof,

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and means for biasing rocking movement of the shaft toward the first position thereof, said biasing means comprising said gate and said barrier having a center of mass intermediate the shaft and the first side wall.

19. The combination of claim 18, wherein said gate underlies a portion of and is immediately adjacent the travel path, whereby a bottle disposed in the portion of the travel path overlying the gate will act by gravity thereon to hold the shaft in its second position.

20. The combination of claim 19, wherein said gate is inclined upwardly toward the second side wall when the shaft is in its first position.

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