June 11, 1968 R. E. LINDENSCHMIDT ET AL 3,387,905

CABINET WITH MEANS FOR MAKING RECEPTACLE THEREIN ACCESSIBLE

Filed Sept. 15, 1966 3 Sheets-Sheet 1

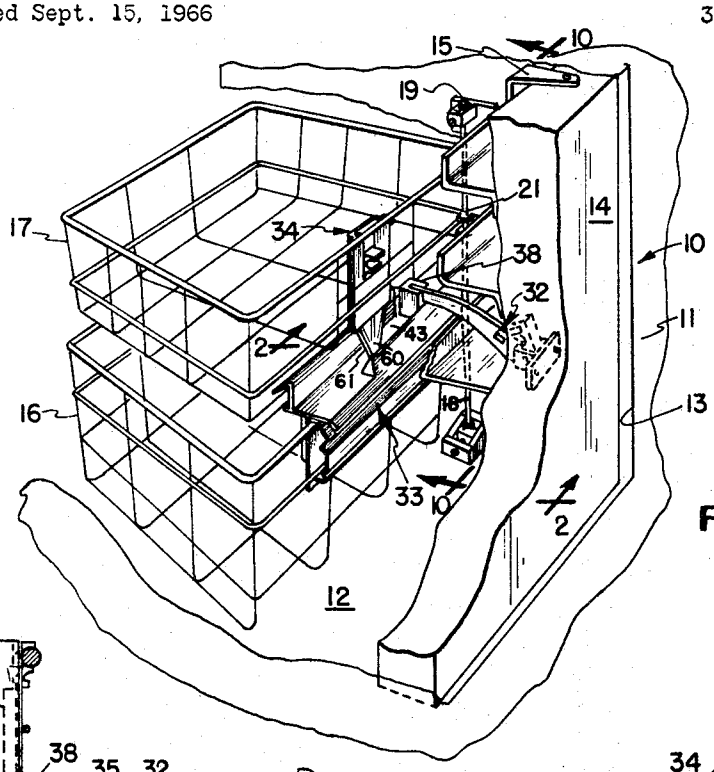


FIG. 1

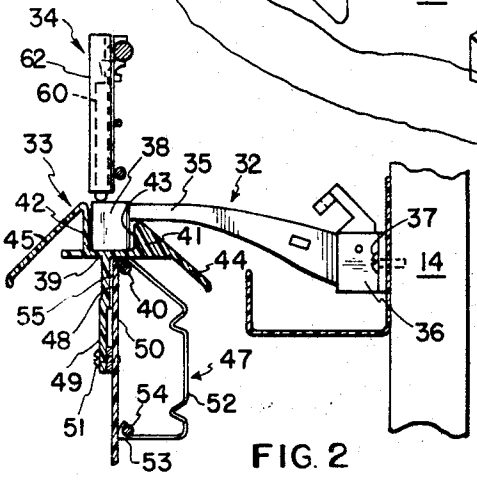


FIG. 2

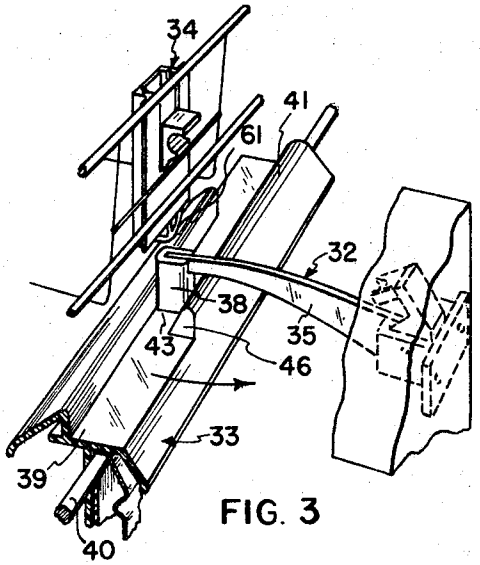


FIG. 3

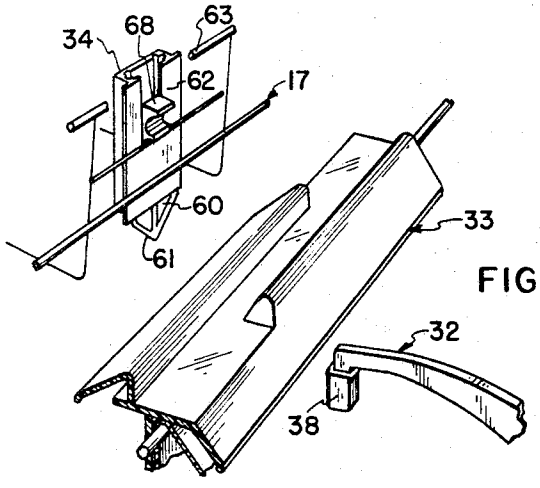


FIG. 4

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CABINET WITH MEANS FOR MAKING RECEPTACLE THEREIN ACCESSIBLE

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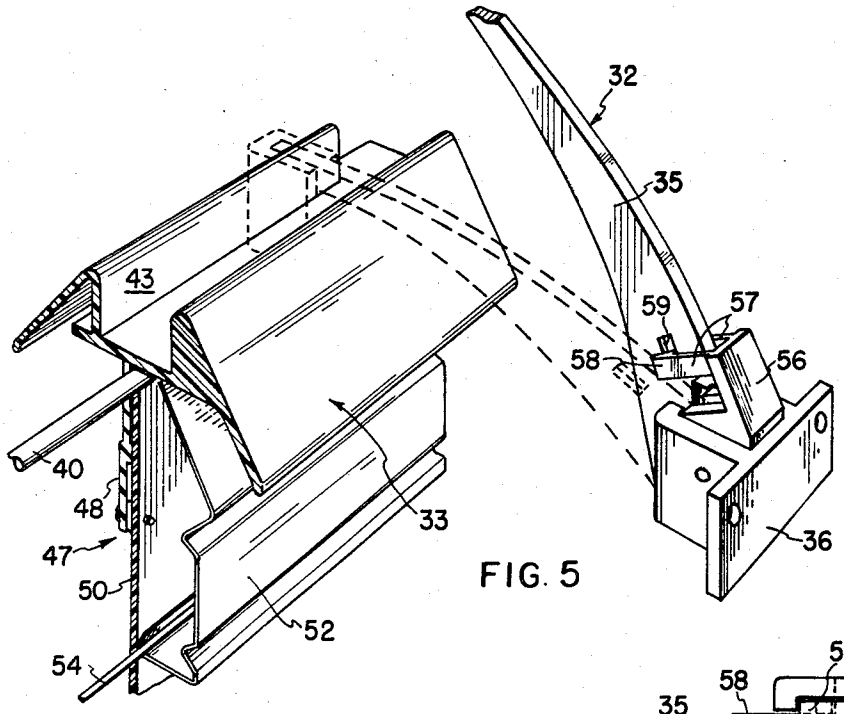


FIG. 5

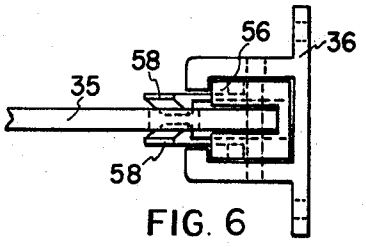


FIG. 6

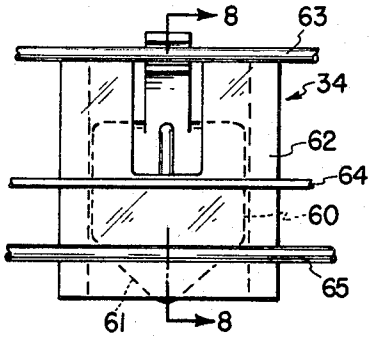


FIG. 7

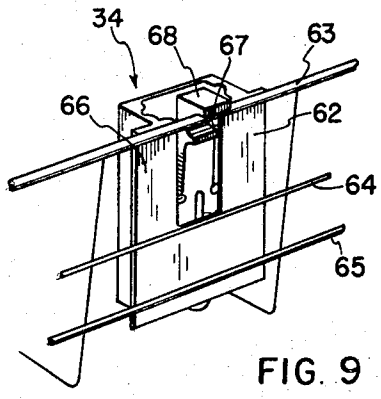


FIG. 9

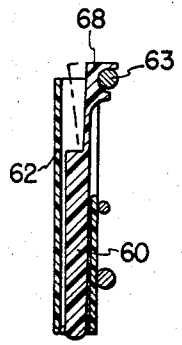


FIG. 8

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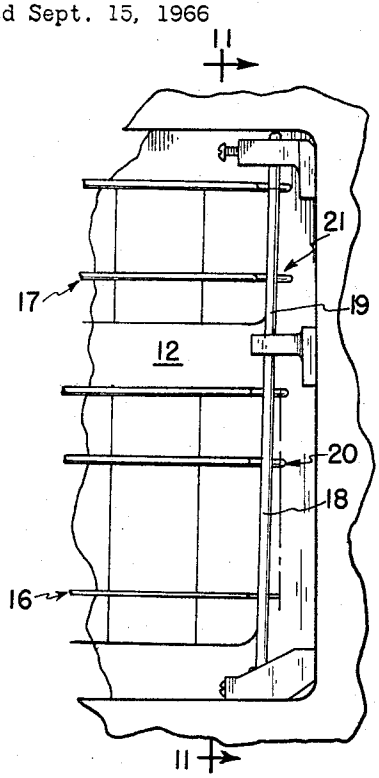


FIG. 10

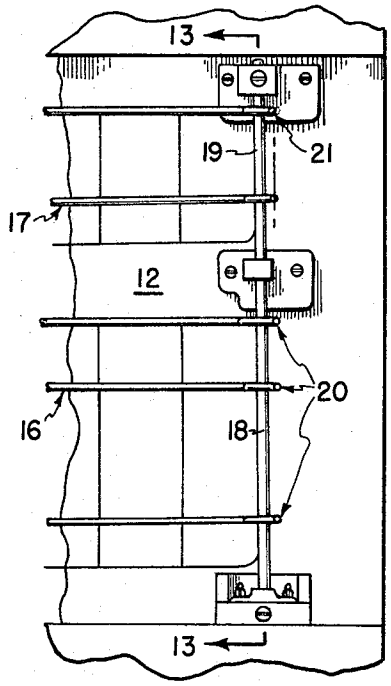


FIG. 11

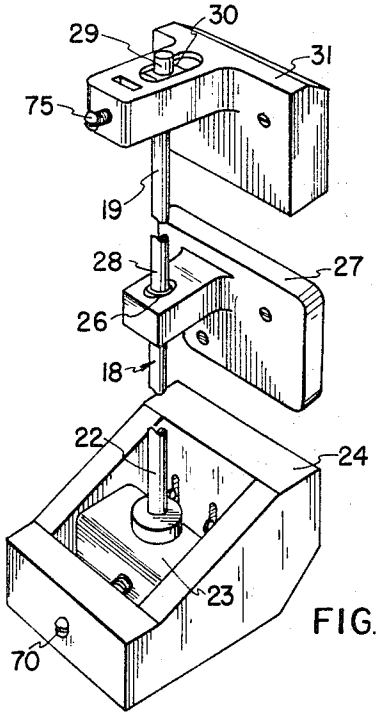


FIG. 12

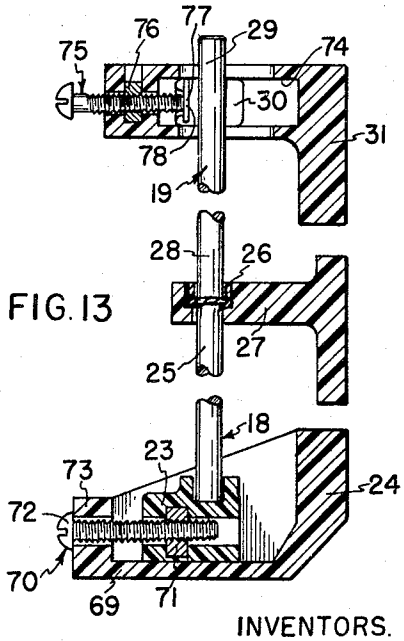


FIG. 13

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CABINET WITH MEANS FOR MAKING RECEPTACLE THEREIN ACCESSIBLE

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16 Claims. (Cl. 312—274)

This invention relates to cabinet structures and in particular to cabinet structures having one or more internal receptacles and means for making such receptacles accessible when desired.

In one conventional cabinet structure such as a freezer cabinet structure, a plurality of receptacles in the form of goods holding baskets are disposed within the freezer compartment. Access to the freezer compartment is provided by means of a front opening selectively closed by a door. In the known constructions, the baskets may be movably carried therein as on slides or rollers. The present invention comprehends an improved structure for causing such compartment mounted receptacles to be made accessible as a concomitant of the opening of the cabinet door.

Thus, a principal feature of the present invention is the provision of a new and improved cabinet structure.

A further feature of the invention is the provision of such a cabinet structure including a receptacle disposed within a cabinet compartment and new and improved means for making said receptacle accessible to a user as desired.

Another feature of the invention is the provision of such a cabinet structure having new and improved means for releasably connecting the door of the cabinet to a receptacle for movement with the door when the door is moved from a closed position to a partially opened position and disassociating the door from the receptacle when the door is moved beyond the partially opened position.

A further feature of the invention is the provision of such a cabinet structure including means for biasing the receptacle to a retracted position within the cabinet compartment.

A still further feature of the invention is the provision of such a cabinet structure wherein the biasing means includes adjustable means for controlling the levelness of the receptacle with respect to the bottom of the compartment.

Yet another feature of the invention is the provision of such connecting means for automatically reconnecting the door to the receptacle when the door is swung from beyond the partially opened position back to the closed position.

Still another feature of the invention is the provision of such a cabinet structure further including means for selectively disabling the connecting means to permit movement of the cabinet door independently of the receptacle when desired.

A further feature of the invention is the provision of such a cabinet structure including a second such receptacle and means for moving the second receptacle as a concomitant of movement of the door.

A still further feature of the invention is the provision of such a cabinet structure wherein the second receptacle is releasably connected to the first receptacle for controlled movement thereof as a result of movement of the door.

Another feature of the invention is the provision of such a cabinet structure wherein the means for moving the second receptacle as a result of movement of the door includes means for effectively disabling the same to permit movement of the door independently of the second receptacle when desired.

Still another feature of the invention is the provision of such a cabinet structure wherein the receptacle mounting means comprises means for pivotally carrying the receptacle about a generally vertical axis.

A further feature of the invention is the provision of such a cabinet structure wherein the means for mounting a plurality of such receptacles comprises means for pivotally carrying the receptacles about a common pivotal axis one above the other.

Other features and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

FIGURE 1 is a fragmentary perspective view of a cabinet structure embodying the invention;

FIGURE 2 is a fragmentary vertical section thereof taken substantially along the line 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary enlarged perspective view thereof illustrating the arrangement thereof upon release of the second basket from association with the first basket;

FIGURE 4 is a fragmentary perspective view thereof illustrating the arrangement thereof upon release of the first basket from the means connecting it to the door;

FIGURE 5 is a fragmentary enlarged perspective view illustrating the selective positioning of the connecting arm in a released position in full lines, and in a basket connecting position in dotted lines;

FIGURE 6 is a fragmentary bottom view of the connecting arm in the released position;

FIGURE 7 is a fragmentary front elevation showing the means for connecting the upper basket to the lower basket in a released position;

FIGURE 8 is a vertical section thereof taken substantially along the line 8—8 of FIGURE 7;

FIGURE 9 is a perspective view thereof;

FIGURE 10 is a fragmentary vertical section taken substantially along the line 10—10 of FIGURE 1;

FIGURE 11 is a fragmentary vertical section taken substantially along the line 11—11 of FIGURE 10;

FIGURE 12 is a fragmentary isometric view of the pivot means for mounting the baskets; and

FIGURE 13 is a fragmentary vertical section taken substantially along the line 13—13 of FIGURE 11.

In the exemplary embodiment of the invention as disclosed in the drawing, a cabinet structure generally designated 10 is shown to comprise a cabinet 11 defining a compartment 12. Access to the compartment is provided through a front opening 13 selectively closeable by a door 14 movably carried on the cabinet 11 by suitable hinges 15 for pivotal movement about a generally vertical axis. In the illustrated embodiment, the cabinet structure 10 comprises a freezer cabinet structure wherein the cabinet 11 comprises an insulated cabinet with compartment 12 being suitably refrigerated by conventional refrigeration means (not shown).

As shown in FIGURE 1, a pair of receptacles 16 and 17 are provided within the compartment 12. Herein, the receptacles comprise wire baskets such as conventionally provided for holding frozen foods and the like. As shown, the baskets 16 and 17 are normally disposed in a retracted position within compartment 12 rearwardly of the front opening 13. Basket 17 may be disposed within the compartment 12 closely above basket 16 for efficient utilization of the refrigerated space within the compartment. In utilizing the baskets 16 and 17, it is desirable that the baskets be movable from the recessed position within compartment 12 to a forward accessible position at opening 13. For this purpose, the baskets are carried for pivotal movement (herein about a common, substantially vertical axis) by means of a lower pivot rod 18 and an upper, axially aligned pivot rod 19, basket 16 being fixedly secured at one corner 20 to the lower rod 18 and basket 17 being fixedly secured at one corner 21 to the

upper pivot rod 19. As shown in FIGURES 10 and 11, the corners 20 and 21 are inturned to accommodate the pivot rods, with the rods being fixedly secured thereto as by welding or the like.

The lower pivot rod 18 has a lower end 22 pivotally carried in a bearing 23 adjustably mounted in a lower mounting block 24, and an upper end 25 rotatably carried in a bearing 26 carried by a mid-bracket 27. The upper pivot rod 19 has a lower end 28 rotatably carried in the bearing 26 and an upper end 29 rotatably carried in a bearing 30 adjustably mounted in an upper mounting block 31. As best seen in FIGURES 10 and 11, the aligned rods 18 and 19 extend in compartment 12 at a slight angle to the vertical, both upwardly to the right as seen in FIGURE 10 and upwardly to the rear as seen in FIGURE 11, thereby biasing the baskets pivotally to the retracted position of FIGURE 1 when the baskets are allowed to move freely on the pivot rods under the influence of gravity.

As indicated briefly above, when the user opens the cabinet door 14, it is desirable that the baskets 16 and 17 be moved from the retracted position of FIGURE 1 forwardly to be accessible at the opening 13. To effect such desirable controlled positioning of the baskets, a connector 32 is provided on the door having selective engagement with a catch 33 on basket 16 and a latch member 34 is provided on basket 17 having selective engagement with the catch 33. In the illustrated embodiment, the connector 32, catch 33, and latch 34 are cooperatively associated so as to cause both baskets 16 and 17 to swing outwardly on the axis of rods 18, 19 to a first accessible position when the door is moved to a first partially open position, such as illustrated in FIGURE 3. At this point, the latch 34 is released from the catch 33 and further outward movement of the door causes further outward movement of the lower basket 16 only. When the door 14 swings outwardly to a second partially open position with the basket 16 being then disposed at a second accessible position as shown in FIGURE 4, connector 32 is disengaged from the catch 33 permitting the door to be swung to a fully open position outwardly beyond the second partially open position independently of the baskets. The bias on the baskets 16 and 17 tending to restore them to the retracted position of FIGURE 1 is preferably relatively small so that the baskets remain accessible for a sufficient period of time to permit the user to manually retain the selected basket as desired.

Referring now more specifically to FIGURE 2, the connector 32 may be seen to include an arm 35 pivotally carried on a bracket 36 mounted on the rear of door 14 by suitable means such as screws 37. The arm carries at its distal end a slide member 38 which rests on a horizontal plate 39 extending transversely along the upper front wire portion 40 of the lower basket 16. As shown in FIGURE 2, the catch 33 further includes a front upright ledge portion 41 and a rear upright ledge portion 42 defining therebetween a channel 43 in which the slide member 38 is received in the retracted position of the structure as shown in FIGURE 1. The catch 33 further includes a front forwardly inclined camming portion 44 and a rear, rearwardly inclined camming portion 45 extending to below the level of the horizontal plate portion 39. The front ledge 41 terminates at a shoulder 46 at a point somewhat to the left of the center of the midportion of the catch 33, as shown in FIGURE 3. The catch may be secured to the basket by suitable means such as mounting structure 47 including a depending flange 48 on the catch plate 39, a pair of clamp plates 49 and 50 clamped to the flange 48 by suitable means such as screws 51 and a formed retainer 52 having a hooked lower end 53 engaging a lower wire 54 of the basket 16 and a hooked upper end 55 extending over the upper wire 40 and downwardly between clamp member 50 and flange 48.

The connector arm 35 may be retained in a retracted position, as shown in FIGURE 5, by a catch 56 on bracket 36 which includes a pair of spring fingers 57 provided at their distal ends with catches 58 releasably receivable in a slot 59 in the connector arm 35. Thus, the connector may be rendered inoperative when desired, as shown in full lines in FIGURE 5, to permit the door 14 to be swung open independently of the baskets 16 and 17.

Referring now more specifically to FIGURES 7 through 9, latch 34 includes a latch member 60 having a lower V-shaped cam portion 61 normally received in channel 43. The latch member 60 comprises a flat member mounted for free vertical substantially planar movement in a housing 62 carried on the upper front wires 63, 64 and 65 of the upper basket 17. The latch housing 62 is provided with a front wall 66 having an upwardly opening slot 67 in which is freely movable a forwardly projecting catch portion 68 of the latch member 60. The latch 68 is suitably recessed to engage the basket wire 63 in an uppermost position of the latch member, as shown in FIGURE 8, to retain the latch member in an inoperative position when desired. As shown in FIGURE 8, to dispose the catch 68 in engagement with the wire 63, the catch is sprung rearwardly of the wire and then allowed to spring forwardly into engagement therewith. Release of the catch is effected by a rearward depression thereof followed by a downward movement of the latch to position the catch to below the wire 63.

Referring now to FIGURES 1 through 4, the operation of the cabinet structure 10 is automatically effected as follows. The latch 34 is normally in the lower position with the cam portion 61 received in the channel 43 and the connector 32 is disposed with the slide member 38 also received in channel 43 when the door 14 is in the closed position. As the user swings the door 14 from the closed position of FIGURE 1 to the partially open position of FIGURE 3, the baskets 16 and 17 are swung on the axis of pivot rods 18 and 19 by the forward pulling force of the slide member 38 against the flange 41. As the baskets 16 and 17 and door 14 swing outwardly, the slide member 38 moves longitudinally through channel 43 to engage the cam portion 61 of the latch 34. Concurrently, the basket 17 is swung with basket 16 by the engagement of the latch member 60 with the rear flange 42 of the catch 33. When the slide member 38 is moved sufficiently outwardly through the channel, i.e., toward shoulder 46, the slide member engages the cam surface 61 causing the latch member to ride up on the slide member to dispose the latch member 60 in the upper position thereof as shown in FIGURE 2, out of channel 43 and thereby permit the lower basket 16 to move from under the upper basket 17. When the catch 33 moves to forwardly of the latch 34, as shown in FIGURE 4, the latch member 60 moves back downwardly from the housing 62.

Continued outward swinging of the door 14 causes the slide member 38 to continue to move through the channel 43 until it moves outwardly of shoulder 46, thereby disengaging the connector arm 35 from the catch 33 and permitting the door 14 to be swung to the fully open position independently of the lower basket 16. As the biasing of the baskets to the retracted position effected by the slight angularity of the pivot rods causes the baskets to swing slowly back to the retracted position of FIGURE 1, the user may effectively retain either of the baskets in the forwardly disposed accessible position thereof. Illustratively, if the user merely wishes access to basket 16, he may allow basket 17 to return to the retracted position while swinging basket 16 to the fully accessible position, or, alternatively, if he wishes access to the upper basket 17, he may swing this basket to the fully accessible position, and in doing so the latch 34 will ride up on camming portion 45 of catch 33 to have the camming portion 61 again received in the channel 43. If the user wishes only basket 16 to be swung out automatically as discussed above, he may disable the latch 34 by engaging the catch 68 thereof with the wire 63, as shown in FIG-

URE 9, whereupon the basket 17 will remain in the retracted position independently of the automatic swinging of the basket 16 effected by the connector 32 as described above.

In closing door 14, the slide member 38 rides up on the forward camming portion 44 to be returned to its normal position in channel 43, as shown in FIGURE 1. In the event that the basket 16 is so positioned that the slide member 38 rides up onto the plate portion 39 to the left of the shoulder 46, the slide member 38 moves back into the channel 43 as the door and basket are swung to the position of FIGURE 1. In the event that the latch member 60 is disposed in the channel 43 at this time, the slide member 38 cams the latch member upwardly so as to pass thereunder to the fully retracted position of FIGURE 1. If the baskets are in the fully retracted position, the slide member 38 of the connector 32 merely slides up on the cam portion 44 to the right of the latch member 60, as seen in FIGURE 1, directly back to the fully retracted position therein. In the event that the basket 17 is in the retracted position when the basket 16 is swung back to the retracted position, the latch member 60 rides up on the rear cam portion 45 into the channel 43.

As indicated briefly above, the pivot rods 18 and 19 are carried in bearings 23 and 30 which are adjustably mounted in the respective brackets 24 and 31. Thus, suitable adjustment of the angularity of the pivot rods for control of the levelness of the baskets with respect to the compartment is effectively provided. More specifically, as shown in FIGURE 13, the lower bearing 23 is slidably carried on the lower wall 69 of the bracket 24. An adjustment member, herein a screw 70, is threaded through a nut 71 carried in the bearing 23. The bearing 23 tends to move to the right, as shown in FIGURE 13, as a result of the weight of the basket 16 carried thereby and the relatively fixed disposition of the upper end 25 of the rod 18 in the bearing 26. The head 72 of screw 70 bears against an upright wall 73 on the bracket 24 so as to limit the movement of the bearing 23 and, thus, control the positioning of the bearing by the threaded adjustment of the screw 70.

The upper bearing 30 comprises a member slidably received in a slot 74 in the mounting block 31. An adjusting member in the form of a screw 75 is threaded through a nut 76 carried in the mounting block 31 forwardly of the slot 74. Member 30 may be formed of a suitable material, such as nylon, and may be provided with a guide plate 77 against which the inner end 78 of the screw 75 bears as the screw is threaded through the nut against the member 30. Pivot rod 19 tends to pivot in a counterclockwise direction, as seen in FIGURE 13, as a result of the weight of basket 17 carried thereby and, thus, screw 75 adjusts the angle disposition of the pivot rod and thus the levelness of the basket by the adjustable disposition of the screw end 78 against which the plate 77 abuts. Thus, the user may control the levelness of the respective baskets 16 and 17 with respect to the compartment by suitable adjustment of screws 70 and 75 as discussed above.

While we have shown and described one embodiment of our invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as defined in the appended claims.

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. Structure comprising:
cabinet means defining a storage space and having an access opening;
means defining a closure;
means for swingably mounting said closure means on said cabinet means for selectively closing said opening;
a receptacle;
means for movably mounting said receptacle in said space adjacent said opening; and
means releasably connecting said closure to said receptacle for movement of said receptacle from a retracted position substantially fully within said space outwardly through said opening when said closure is swung from a closed position to a partially open position and for release of said receptacle as a result of said closure being swung further from said closed position beyond said partially open position.

2. The structure of claim 1 including means for biasing said receptacle to said retracted position whereby said receptacle returns to said retracted position when said connecting means releases the receptacle.

3. The structure of claim 1 including adjustable means for leveling said receptacle within said space.

4. The structure of claim 1 wherein said connecting means is arranged for automatically reconnecting said closure to said receptacle when said closure is swung from beyond said partially open position to said closed position.

5. The structure of claim 1 further including means for selectively disabling said connecting means whereby said closure may be swung from and to said closed position independently of said receptacle.

6. The structure of claim 1 further including a second receptacle, means for movably mounting said second receptacle in said space adjacent said opening, and means for moving said second receptacle from a retracted position substantially fully within said space outwardly through said opening when said closure is swung from a closed position to a second partially open position intermediate said closed position and said first-named partially open position and for release of said second receptacle as a result of said closure being swung further from said closed position beyond said second partially open position.

7. The structure of claim 6 wherein said means for moving said second receptacle comprises means releasably connecting said second receptacle to said first-named receptacle.

8. The structure of claim 7 wherein said first-named connecting means includes means for releasing said second-named connecting means as a result of said closure being swung to said second partially open position.

9. The structure of claim 1 including means for gravitationally biasing said receptacle to said retracted position whereby said receptacle returns to said retracted position when said connecting means releases the receptacle.

10. The structure of claim 1 further including a second receptacle, means for movably mounting said second receptacle in said space adjacent said opening, means for moving said second receptacle from a retracted position substantially fully within said space outwardly through said opening when said closure is swung from a closed position to a second partially open position intermediate said closed position and said first-named partially open position and for release of said second receptacle as a result of said closure being swung further from said closed position, and means for selectively disabling said means for moving said second receptacle whereby said closure may be swung from and to said closed position independently of said second receptacle.

11. The structure of claim 1 including adjustable means for leveling said receptacle within said space, said movable receptacle mounting means comprising pivot means having a substantially upright axis and said adjustable means comprising means for adjusting the angular disposition of said axis.

12. The structure of claim 1 wherein said closure mounting means comprises means pivotally mounting said closure for swinging movement about a substantially vertical axis.

13. The structure of claim 1 wherein said connecting means comprises a channel member carried by said receptacle and a hook member carried by said closure, said hook member having a turned distal end slidably releasably received in said channel member.

14. The structure of claim 1 further including a second receptacle, means for movably mounting said second receptacle in said space adjacent said opening and said first-named receptacle, and means for moving said second receptacle from a retracted position substantially fully within said space outwardly through said opening when said closure is swung from a closed position to a second partially open position intermediate said closed position and said first-named partially open position and for release of said second receptacle as a result of said closure being swung further from said closed position beyond said second partially open position, said receptacles being disposed one above the other in their retracted positions.

15. The structure of claim 1 further including a second receptacle, means for movably mounting said second receptacle in said space adjacent said opening, and means for moving said second receptacle from a retracted position substantially fully within said space outwardly through said opening when said closure is swung from a closed position to a second partially open position intermediate said closed position and said first-named partially open position and for release of said second receptacle as a result of said closure being swung further from said closed position beyond said second partially open position, said means for mounting said receptacles comprising means for pivotally mounting said receptacles for movement about a common substantially upright axis.

16. The structure of claim 1 further including a second receptacle, means for movably mounting said second receptacle in said space adjacent said opening, and means for moving said second receptacle from a retracted position substantially fully within said space outwardly through said opening when said closure is swung from a closed position to a second partially open position intermediate said closed position and said first-named partially open position and for release of said second receptacle as a result of said closure being swung further from said closed position beyond said second partially open position, said means for moving said second receptacle comprising means releasably connecting said second receptacle to said first-named receptacle, and said means for connecting said second receptacle to said first receptacle includes means for automatically reconnecting said second receptacle to said first receptacle when said receptacles are returned to said retracted positions.

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