March 8, 1949. C. W. BALL 2,463,506

CABINET WITH SUSPENDED RACK

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Fig. 1

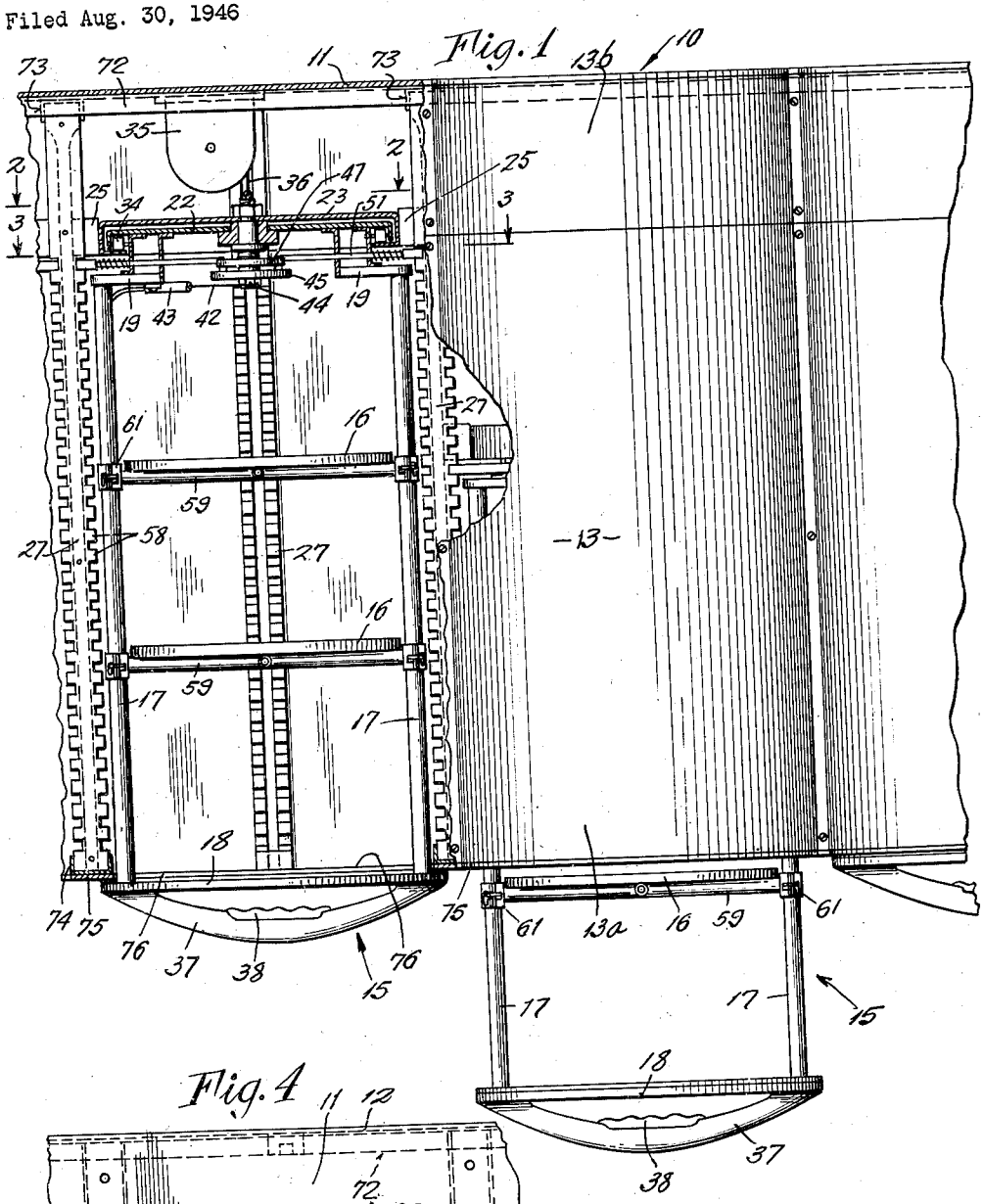
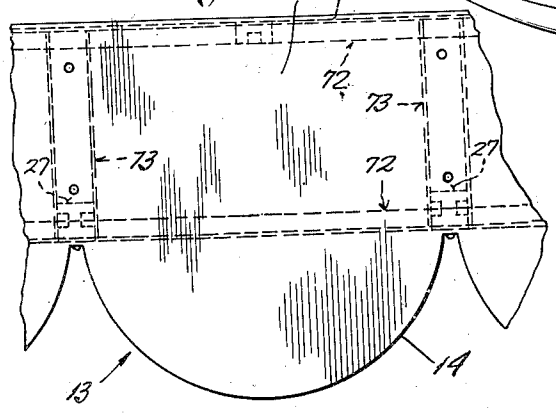


Fig. 4



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Fig. 2

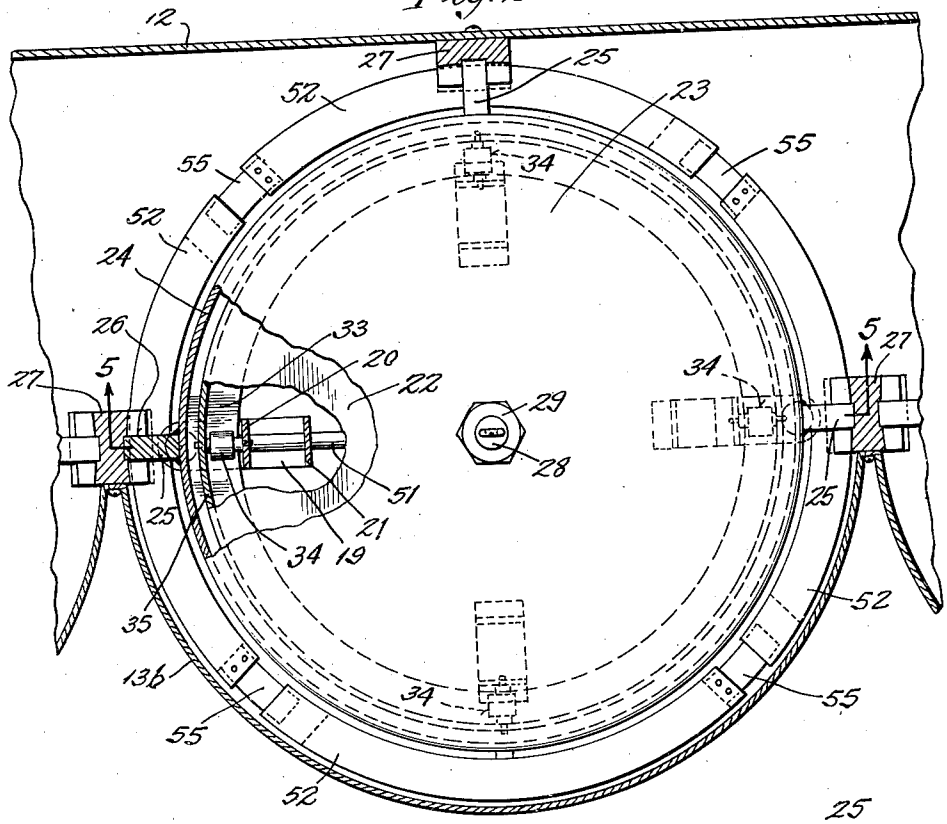


Fig. 5

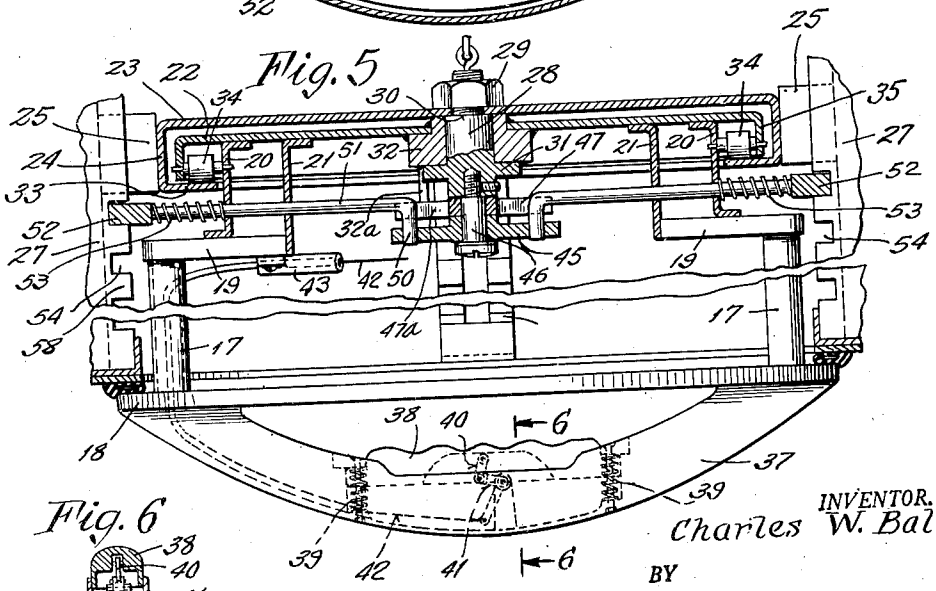
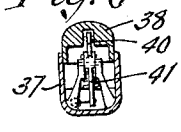


Fig. 6



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Fig. 3

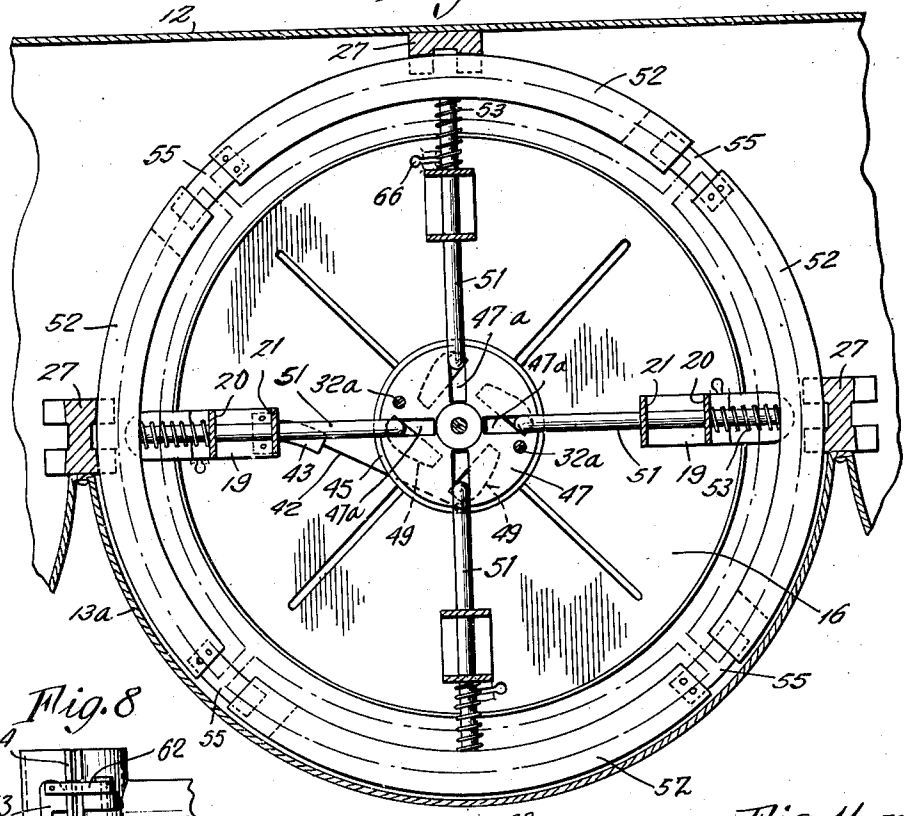


Fig. 8

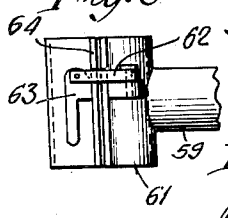


Fig. 9

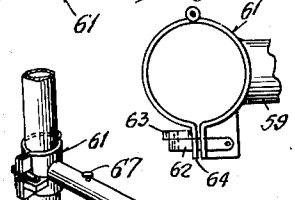


Fig. 10

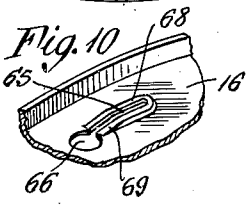


Fig. 11

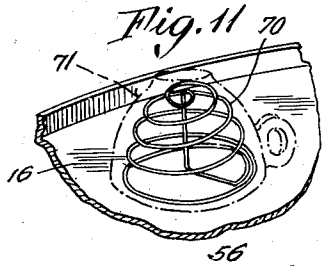


Fig. 12

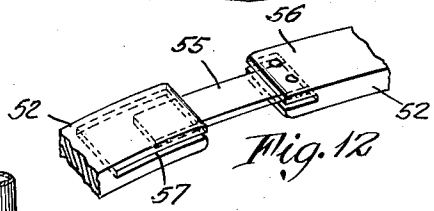


Fig. 7

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UNITED STATES PATENT OFFICE

2,463,506

CABINET WITH SUSPENDED RACK

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Application August 30, 1946, Serial No. 693,990

12 Claims. (Cl. 312—181)

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This invention relates to cabinets such as are suspended from a wall or ceiling, and more particularly to kitchen cabinets.

An object of the invention is to provide an improved kitchen cabinet for the storage of dishes, food and other kitchen articles, in which all of the storage space is quickly and conveniently accessible without the necessity of reaching into high or remote spaces, standing on chairs, etc.

In prior kitchen cabinets a major drawback has been the diffculty of reaching the storage space provided by the higher shelves in the cabinet. This has often resulted in this space being unused, since the housewife preferred to store the various kitchen articles in the lowermost and middle shelves of the cabinet, from which she could remove the articles without delay or difficulty at any time.

According to the present invention a novel cabinet is provided comprising a housing in which one or several rotary carriers are mounted. Each rotary carrier has a plurality of generally circular shelves located one above the other in spaced relation. The rotary carriers are mounted within the housing to be freely rotatable, and also to be vertically axially movable for lowering and raising. The bottom of the housing is open, and the housing is mounted either high on a wall or suspended from the ceiling. By this organization, the storage space within the housing is made readily and conveniently accessible, since it is merely necessary for the housewife to lower one of the rotary carriers having the shelves to the extent necessary to expose the shelf carrying the desired articles. Since the rotary carrier is at all times freely rotatable, it may be turned as desired to bring any article to the front where it may be easily removed. Thus articles located on the uppermost shelves are made as easily accessible as articles on the bottom or lowermost shelves.

A convenient handle is provided on the bottom of each rotary carrier, by which the latter may be easily manipulated, either raised, lowered or turned. Also, a latch means is provided which enables the rotary carrier to be retained in different raised or lowered axial positions.

A feature of the invention resides in the arrangement of the handle and latch operator, the latter being located not only so that gripping of the handle will automatically release the latch, but also arranged so that simple, continuing downward pressure on the latch release is all that is required to both unlock the rotary carrier and also cause it to be lowered. The effort required to lower or raise the rotary carriers is held to a minimum by means which compensate for the weight of the carrier and the articles carried thereby.

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Another object of the invention is to provide a cabinet as above which is simple and sturdy in construction, and is fool proof in operation at all times.

A further object of the invention is to provide a cabinet according to the foregoing, which is economical to manufacture.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a front elevation of the improved cabinet of the invention, a portion of the housing being broken away to reveal interior details.

Fig. 2 is a fragmentary horizontal section taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary horizontal section taken on the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary top or plan view of the cabinet of Fig. 1.

Fig. 5 is a fragmentary vertical section taken on the line 5—5 of Fig. 2.

Fig. 6 is a section taken on the line 6—6 of Fig. 5.

Fig. 7 is a perspective view of the shelf-supporting crossbars or spider.

Fig. 8 is a fragmentary elevation of one end of a shelf-supporting crossbar, showing the clamping mechanism.

Fig. 9 is a top view of the end of the crossbar shown in Fig. 8.

Fig. 10 is a fragmentary perspective view of a portion of a shelf, showing the slotted construction for securing the shelf to the supporting spider.

Fig. 11 is a fragmentary perspective view of a portion of a shelf having a cup-supporting means secured thereto, and

Fig. 12 is a fragmentary perspective view of a joint between adjacent segments of the latch mechanism which locks the rotary carrier in various lowered or raised positions.

Referring to Fig. 1, the improved cabinet of the present invention comprises a housing 10 which is adapted to be supported in an elevated position, either on a supporting wall or by suspending it from the ceiling. The housing 10 has a flat top 11 and a flat back 12, and has a front wall comprising a plurality of semi-cylindrical sections 13 mounted side-by-side with their axes extending vertically. As shown in Fig. 4, the top 11 has a scalloped front edge 14 to enable it to conform to the contour of the front wall of the cabinet, comprising the semi-cylindrical sections 13.

Each section 13 defines a compartment in the housing, in which is rotatably mounted a rotary carrier 15 having a plurality of shelves 16 for the purpose of supporting kitchen utensils, articles of food, and the like. The rotary carriers 15 are mounted in the housing 10 for axial lowering or

raising movement, as well as for rotary movement in any lowered or raised positions.

Each rotary carrier 15 comprises a pair of vertical posts 17 which are rigidly secured at their bottom ends to a circular base plate 18, and at their top ends to inwardly extending plates 19 which latter are each in turn supported by a pair of brackets 20 and 21 depending from a circular suspension plate 22 in the form of an inverted shallow dish. The plate 22 comprises part of a suspension device by which the carrier 15 is supported in the housing 10. This suspension device further includes a second circular suspension plate 23 having a depending flange 24 to which a plurality of outwardly radially extending lugs 25 are secured, Figs. 2 and 5. The lugs 25 ride in vertical grooves 26 of upright strips 27 which are secured at their top and bottom ends to the housing 10 and which act as vertical tracks or guides.

A pivotal connection is provided between the suspension plates 22 and 23, this connection comprising a stud 28 passing through the center of the plate 23 and having a nut 29 which draws up a shoulder 30 of the stud tightly against the plate and rigidly secures the stud thereto. Also a flange 31 is provided on the stud 28 for supporting a collar 32 which latter passes through and is rigidly secured to the suspension plate 22. The collar 32 is rotatable on the stud 28, as is therefore the plate 22 about the stud and relative to the plate 23.

To maintain exact parallelism of the suspension plates 22 and 23 so as to prevent swinging or looseness of the rotary carrier 15 while at the same time enabling the carrier to be freely rotatable, a track and cooperable rollers are provided, carried by the said plates. As shown in Figs. 2 and 5, the suspension plate 23 has a second flange 33, acting as a track, extending inwardly from the bottom edge of the flange 24, and the suspension plate 22 has rollers 34 pivoted in the peripheral flange 35 of the plate and in the depending brackets 20 thereof. The rollers 34 ride on the track provided by the inturned flange 33, and thereby prevent any tendency for the suspension plates to wobble or become out of parallelism.

For the purpose of counterbalancing the weight of the rotary carrier 15 a spring compensator 35 is provided, secured to the top 11 of the housing and having an extendable cable 36 which is secured to the pivot stud 28 of the suspension device.

According to the above construction each rotary carrier 15 may be lowered or raised in the housing 10 by virtue of the said suspension device for the carrier riding in the vertical slides 27; also each carrier may be rotated when in any raised or lowered position by virtue of the pivotal connection between the suspension plates 22 and 23 for the carrier.

For convenience of operation of the carriers 15, a segment-shaped handle 37 is secured to the underside of the bottom plate 18 of each carrier to extend diametrically across the same. The handles 37, by being so shaped and located, enable the rotary carriers to be very quickly and conveniently manipulated, either to raise or lower these, or to turn them.

A novel latching mechanism is provided for maintaining each rotary carrier 15 in any adjusted raised or lowered position. This latching mechanism comprises a manually operable member or grip 38 slidably carried in the upper center portion of the handle 37, and yieldably held in

an extended or raised position as shown in Fig. 5 by compression springs 39. The member 38 is connected through a link 40 and bell crank 41 to a flexible push-pull cable 42 for operating the latter, and the said cable extends through one of the upright posts 17 of the carrier and through a guide 43 secured to one of the plates 19. At its upper end the cable 42 is connected with a lug 44 on the periphery of a cam plate 45 which is rotatably mounted on the bottom of the stud 28 by means of a shouldered pivot screw 46 threaded into the said stud. Directly above the cam plate 45 a guide plate 47 is mounted, the pivot screw 46 passing through the guide plate and the latter being keyed to the collar 32 against relative turning by the rods 32a, Fig. 5.

The cam plate 45 has a plurality of camming slots 49 which receive the downturned ends 50 of horizontal link bars 51, the latter passing through and being slidably carried by the depending brackets 20 and 21 of the suspension plate 22. The ends 50 of the link bars are slidable in slots 47a of the guide plate 47 and are guided thereby. As shown in Fig. 3, the link bars 51 extend radially outward from the center of the rotary carrier 15, and at their outer extremities are secured to latching segments or dogs 52 which extend in a circle around the carrier 15 and are concentric with the pivot stud 28 thereof.

The link bars 51 carry helical compression springs 53 between the segments 52 and brackets 20 for the purpose of yieldably holding the segments in outwardly extended positions. When in such positions, as shown in Fig. 5, the segments 52 may occupy any of a plurality of notches 54 provided in the vertical slides 27 of the housing, and when the segments are so accommodated the rotary carrier 15 is locked against vertical movement.

However, the cam plate 45 and guide plate 47 are so arranged that relative movement between these will cause advancement and retraction of the link bars 51 and segments 52. This relative movement is accomplished by operation of the manually operable member 38 and push-pull cable 42, the said cable turning the cam plate 45 about its pivot while the guide plate 47 remains stationary due to its being keyed to the collar 32.

As shown in Figs. 2 and 12, the ends of the segments 52 are slidably joined together by tongues 55, each tongue being secured in one end 56 of a segment and being slidably received in a slot 57 in the adjacent end of the next segment. These tongue and slot connections between the segments allow the latter to be individually moved and yet connected together. Preferably, the spacing between the adjacent ends of the segments is less than the width of the vertical slides 27 so that no obstruction is encountered when the rotary member 15 is being turned and one segment is leaving the slide while the following segment is entering the slide. It will be noted that the vertical slides 27 are provided with the notches 54 on opposite sides thereof, so that the projections 58 formed by the notches are available for latching purposes in cooperation with the segments or dogs 52 of adjacent rotary members 15.

The shelves 16 may be secured in the carriers 15 in any suitable manner. However, a novel and convenient supporting means for the shelves is illustrated in Figs. 7 through 10. This supporting means comprises a pair of crossbars 59 and 60 forming a generally flat spider for supporting

each shelf 16. Each crossbar 59 has secured to its ends a split sleeve 61 adapted to encompass one of the vertical posts 17, and the crossbar is thus vertically slidable along the said posts. The crossbars may be secured in any adjusted position by draft means associated with the split sleeves 61, the said draft means comprising a link 62 pivotally secured to one edge portion of the sleeve and a cam lever 63 cooperable with a flange 64 on the opposite edge portion of the sleeve for reducing the effective sleeve diameter.

Each shelf 16 has a plurality of slots 65 having enlarged ends 66 through which headed pins 67 carried by the cross-bars may be inserted. Adjacent the slots 65 the shelves are embossed to provide raised portions 68 for engagement with the undersides of the heads of the pins 67. The shelves 16 are preferably made of resilient material, such as thin sheet metal, and the portions 68 are raised a sufficient amount that a continuous pressure is exerted by the heads of the pins 67 to frictionally retain the shelf in place. It is understood, of course, that the raised portions 68 of the shelves have slopes 69 adjacent the enlarged ends 66 of the slots, and that the shelves are secured to the crossbars by a rotary motion after the pins 67 have been inserted in the said enlarged ends.

Referring to Fig. 11, the shelves may be provided with spiral spring shapes 70 for supporting cups 71 (shown in dotted outline), or may be provided with any other suitable positioning or supporting device.

The housing 10 preferably has a framework comprising horizontally extending parallel angles 72, and comprising cross-channels 73 secured to the angles, the said channels receiving the upper ends of the vertical slides 27. The lower ends of the slides 27 may be secured to channels 74 at the bottom of the housing, the said channels being parallel with and directly below the channels 73. The housing 10 may also be provided with a bottom wall 75 having large apertures 76 through which the rotary carriers 15 may pass when they are lowered.

It will be noted that the latch-operating member 38 is located in such a manner that, by a simple continuing downward pressure on the member the latch mechanism will first be released and then the rotary carrier 15 lowered. By combining these two operations so that they result from a single uni-directional pressure, the lowering of any rotary carrier is greatly facilitated.

There is thus provided by the present invention a novel cabinet having special utility for kitchen use and the like, wherein the available storage space in the cabinet is all conveniently and quickly accessible through the mere operation of lowering and, if necessary, rotating the rotary carriers 15. By so doing the uppermost as well as the lowermost shelves of each carrier may be quickly and easily reached by a housewife to remove or replace articles. When it is desired to lower any of the carriers 15 it is merely necessary to grasp the associated handle 37 and depress the grip 38, whereupon the latching mechanism is released so that the carrier may be lowered to the desired extent. The grip 38 may then be released whereupon the latching mechanism becomes automatically operative to lock the carrier in any adjusted lowered position. When in such position the carrier may be turned any desired amount, so that articles located at the rear may be brought to the front. When the carriers 15 are not in use they may be easily and quickly restored to their raised positions in the housing 10 by merely depressing the grip 38 to first release the latching mechanism, and then raising the carrier by means of the handle 37.

In accordance with the above construction the shelves 16 may be readily removed for cleaning and reinstalled without inconvenience and without the use of tools.

The structure shown is simple and extremely sturdy and fool proof, so that a long useful life may be expected from the cabinet. Also, considering the functioning of the device, the parts are relatively few and economical to manufacture.

It will be understood, of course, that a cabinet may be provided having as many rotary carriers 15 as desired, within the limitations of available space. Also, the housing 10 may have other shapes than that shown, provided that the interior space is sufficient to accommodate the rotary carriers 15.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; a manually operable member on the carrier; and releasable means under the control of the member for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions.

2. A cabinet comprising a rotary carrier having a pair of vertical, spaced, parallel posts, and having a plurality of generally circular shelves mounted on the posts in axial alignment and spaced adjustable relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; a manually operable member on the carrier; and releasable means connected with the posts and under the control of the member for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions.

3. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; an elongate handle extending diametrically across the bottom of the carrier and secured to the latter in spaced relation for raising and lowering the carrier; a manually operable member movably mounted adjacent the handle; and releasable means under the control of the member for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions.

4. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive

the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; a handle secured to the bottom of the carrier; a manually operable member movably mounted adjacent the handle; releasable means located at the top of the carrier for retaining the latter in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions; and a flexible cable interconnecting the releasable means and manually operable member for operating said releasable means from the manually operable member.

5. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, said housing having a flat rear wall and a semi-cylindrical front wall, and having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; a manually operable member on the carrier; and releasable means under the control of the member for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions.

6. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; and means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement, said means including a suspension device within the housing and a pivotal connection between the carrier and suspension device, and including vertical tracks in the housing, on which the suspension device rides.

7. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; and means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement, the said means including a suspension device within the housing, having a circular track, and including rollers on the carrier, mounted to travel along the said track.

8. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; a manually operable member on the carrier; and releasable means under the control of the member for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions, and the said releasable means including a plurality of notched vertical strips in the housing, and including a plurality of segments mounted on the carrier and forming a circle, the said segments being cooperable with the notched strips, and being simultaneously advancible into notches or retractable therefrom in response to movement of the operable member.

9. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; a manually operable member on the carrier; and releasable means under the control of the member for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions, and the said releasable means comprising a plurality of notched vertical strips in the housing, and including latch dogs movably mounted on the carrier, and including a cam device connected with the latch dogs and controlled by the operable member.

10. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement, said means including vertical slides in the housing, and including a suspension device riding in the slides and pivotally connected to the carrier; a manually operable member on the carrier; and releasable means under the control of the member for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions, and the said releasable means including a series of projections extending vertically and adjacent the slides, and including latch dogs movably mounted on the carrier and controlled by the manually operable member, the said dogs being cooperable with the projections.

11. A cabinet comprising a rotary carrier having a plurality of generally circular shelves located in axial alignment and spaced relationship one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; releasable means for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions; and a manually operable means connected to the releasable means for controlling the operation thereof.

12. A cabinet comprising a rotary carrier having a plurality of shelves mounted in spaced, axial alignment one above the other; a housing for enclosing the carrier, having an open bottom to receive the carrier; means mounting the carrier in the housing for rotary movement, and for axial lowering and raising movement; releasable means for retaining the carrier in different raised or lowered axial positions, the said carrier being freely rotatable when in said positions; and a manually operable member remote from the releasable means and connected thereto for controlling the operation thereof.

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