Oct. 17, 1933. J. E. BALES ET AL 1,930,547

CABINET CONSTRUCTION

Filed June 7, 1930 2 Sheets-Sheet 1

FIG. 1.

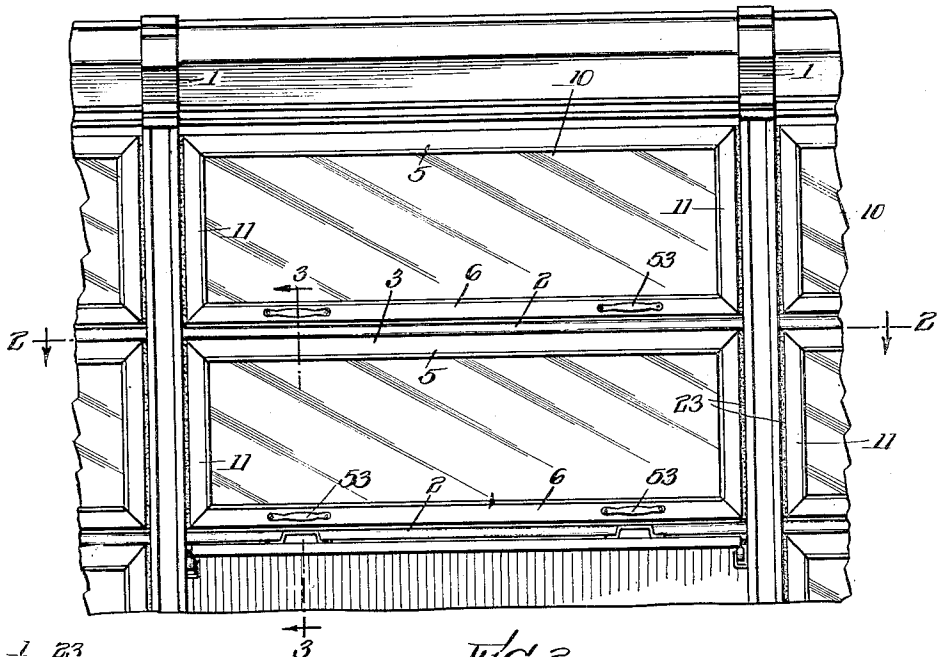


FIG. 2.

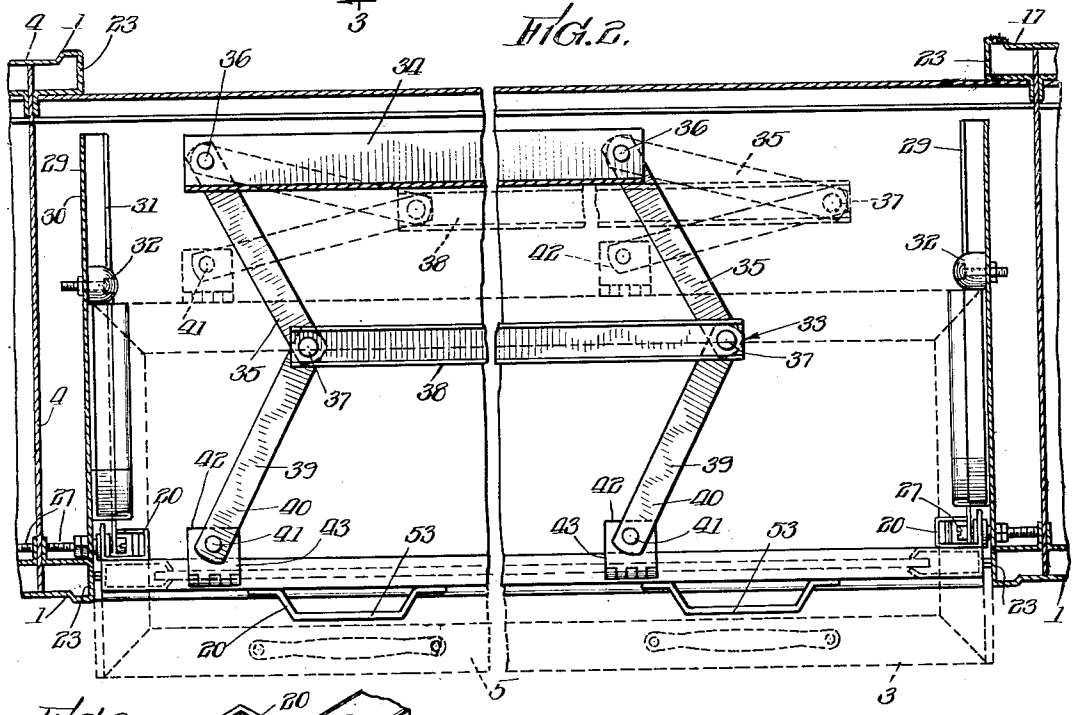
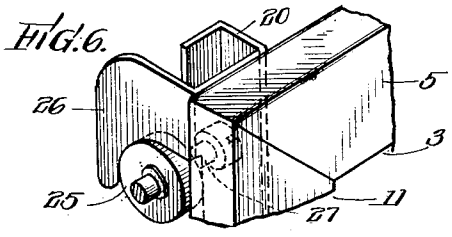


FIG. 6.



Inventor:
James E. Bales
John B O'Connor
By Cheever, Cox & Moore
Attys.

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FIG. 3.

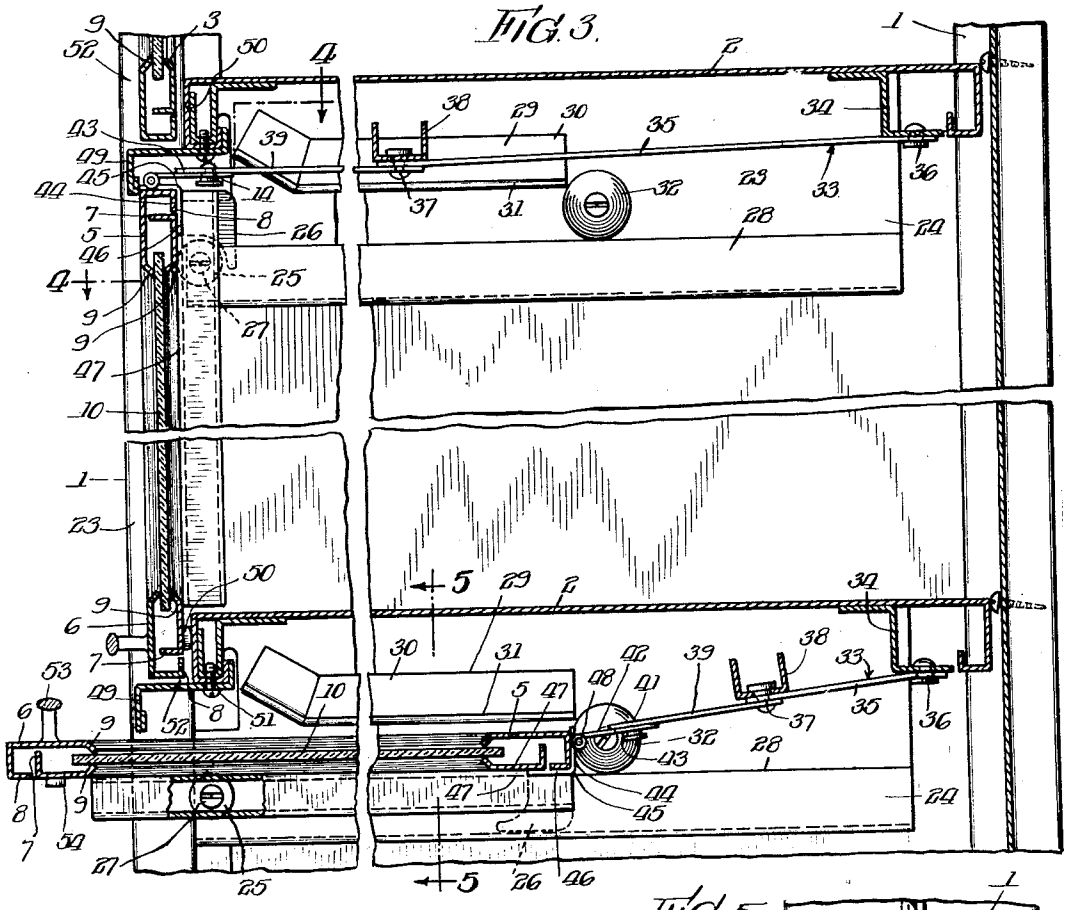


FIG. 4.

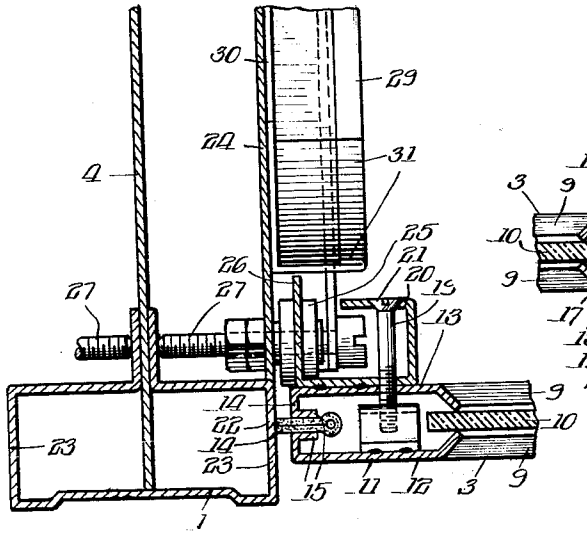
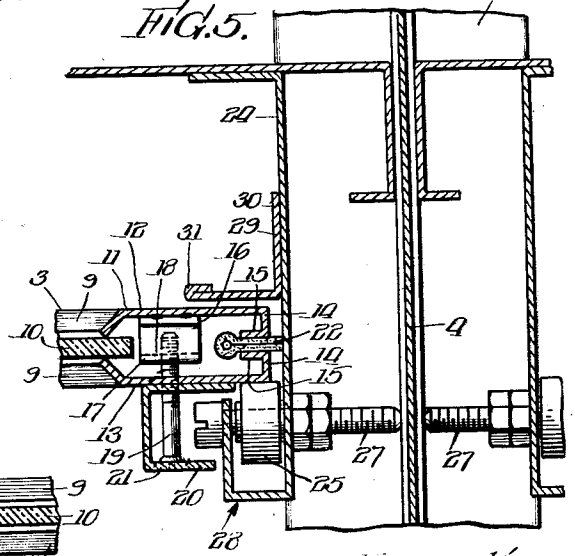


FIG. 5.



Inventor:
James E. Bales
John B. O'Connor
By Cheever, Cox & Moore
attys.

Patented Oct. 17, 1933

1,930,547

UNITED STATES PATENT OFFICE

1,930,547

CABINET CONSTRUCTION

James E. Bales and John B. O'Connor, Aurora, Ill., assignors to Lyon Metal Products, Incorporated, Aurora, Ill., a corporation of Illinois

Application June 7, 1930. Serial No. 459,794

13 Claims. (Cl. 312—110)

This invention relates to cabinet construction in general and particularly to sliding door constructions and arrangements for cabinets. More specifically the invention relates to cabinet doors which slide rearwardly into the cabinet at the top thereof.

The primary object of the invention is to provide new and improved means for slidingly mounting a door to a cabinet.

Another object is to provide an equalizer for disappearing cabinet doors.

Another object is to provide a new cabinet door construction which is provided with means for keeping dust from entering the cabinet, and which is provided with means for rendering the operation of the doors noiseless.

A further object is to provide a novel arrangement of parts for effecting free and easy operating of cabinet doors to prevent the doors from binding during operation.

A still further object is to provide an improved guide for disappearing doors whereby the guide also acts as a stop for the door.

Still another object is to provide new and improved means for maintaining disappearing doors at the proper elevation and to prevent the doors from being raised beyond their normal operating position.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

The invention comprises in general a cabinet divided longitudinally by uprights or pilasters and horizontally by shelf members. Glass panel doors are arranged in the front face between an upper and a lower shelf and adjacent the uprights. These doors are adapted to disappear within each space, being supported by suitable guides arranged on each side of each compartment near the top thereof. An equalizing member is fixed to each disappearing door and to a member arranged inside of each individual compartment to positively provide easy sliding of the doors and to prevent the doors from jamming at the sides of the cabinet. The doors are preferably made of sheet metal and have felt or other material clamped between their side edges to render the cabinet dust proof and to overcome noise during operation of the doors. A member is rigidly connected to each door near the upper part thereof to act as a stop for the doors when they are in closed position. This same member also acts as a skid for the doors when they are being slid in position.

The accompanying drawings illustrate a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is a detail front elevation of a cabinet embodying the invention.

Fig. 2 is a detail plan section on the line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a detail plan section on the line 4—4 of Fig. 3.

Fig. 5 is a detail sectional view on the line 5—5 of Fig. 3.

Fig. 6 is a detail perspective view showing the door provided with an interiorly positioned vertical channel.

The particular cabinet construction herein shown comprises uprights 1 which are spaced at certain intervals. Dividing shelves 2 are arranged between the uprights, and a door 3 is arranged in each space between uprights and a pair of shelves, thereby providing individual compartments.

The entire structure is preferably made from sheet metal, the uprights 1 being formed to the configuration shown in Fig. 4. Front to rear panels 4 connect front and rear uprights 1 and provide sides for the compartments.

Upper and lower door rails 5 and 6 respectively are made in substantially the same manner, and each rail comprises sheet metal front and rear sections as shown in Fig. 3. The rearward side of each rail is provided with an inturned lip 7 which abuts a rearwardly upstanding lip 8 provided on the front of the rails. These upper and lower rails 5 and 6 have turned lips 9, Fig. 3, for engaging and holding glass panels 10 in position.

Side rails 11 each comprise a front section 12 and a rear section 13. These two sections are substantially the same and have outer side edges 14 which are bent inwardly to provide inturned lips or flanges 15. The front section 12 has an angle-shaped member 16 secured thereto in any convenient manner such as by welding. This member 16 has a part 17 fixed thereto which is tapped at 18, Fig. 5, to receive fastening means 19 for holding the sections 12 and 13 together.

Channel members 20 which are fixed to the rear faces of the rear sections 13 have the fastening means 19 passing therethrough as clearly shown in Figs. 4 and 5. The fastening means 19 has its head 21 set in an indentation or recess provided in a leg of the channel member 21 so that it will be flush with the flat face of the section. This fastening member threadedly engages the tapped opening 18 and when screwed in place, holds the two sections 12 and 13 tightly together. The upper rails 5 and 6 may be held together in any suitable manner desired but need have no connecting members arranged therein whatever as the upper and lower rails are rigidly connected to the side rails.

A strip of suitable material 22, such as felt, may be arranged between the lips 15 as shown

in Figs. 4 and 5. This felt is clamped between the flanges due to the tightening engagement of the fastening means 19 with the member 16. The felt is adapted to engage the inner-side faces 23 of alined front uprights 1 to make each compartment practically dust proof and to eliminate unnecessary noise during operation of the doors.

A track 24 is fixed to the under-side of a shelf 2, Fig. 5, and has a roller 25 revolubly arranged in its lower end as shown in Figs. 4 and 5. A combination skid and stop member 26 is fixed to the upper part of the door and is preferably made integral with the channel member 20. This skid and stop member 26 engages a roller 25 as shown in Fig. 3 to limit the forward movement of the door as it is being slid to closed position. This roller is revolubly mounted on a stud or bolt 27 which passes through the U-shaped bottom portion 28 of the track 24 and has its end engaging the inturned wings on the uprights or the front to rear panel 4. This engagement braces the track 24 and prevents it from spreading. When the door is raised and slid rearwardly, the member 26 slides in the bottom portion 28 of the track 24 and acts as a skid.

An upper guide 29 which is fixed to the inside of the track 24, is preferably made from a single piece of sheet metal and comprises a vertical leg 30 and a horizontal leg 31, the leg 31 being folded over as shown in Fig. 4. The leg 30 of the guide 29 is fixed to the track 24 in any convenient manner, such as by welding.

During sliding movement of the door, the skid 26 will engage the bottom of the portion 28 of the track 24, and the door will be confined between the track 24 and the upper guide 29. The stud or bolt 27 has a head which projects beyond the outer leg of the lower portion 28 of the track 24 and projects into the channel member 20. This head acts as a guide stop for a door, preventing the door from being raised too great a distance. When a door is swung to sliding position, a leg of the channel 20 will engage the head of the bolt 27 and limit upward movement thereof. While this head cooperates with the channel to prevent a door from swinging too high, it does not interfere with the closing of the door.

A bumper 32 may be attached to a part of the track 24 and is adapted to engage the uppermost part of the door to limit its inward sliding movement.

Doors of the conventional disappearing sliding type must be operated so that an even pressure is exerted at each end of the door, otherwise the ends of the door will bind against the sides of the cabinet and prevent smooth operation. To overcome this deficiency an equalizer 33, Fig. 2, is provided. This equalizer causes any pressure exerted on one part of the door to be equally transmitted. It also prevents the side of the door from binding or wedging in the track or against the sides of the cabinet.

The equalizer 33 comprises a rear bar 34 which is fixed to a part of the cabinet particularly to the bottom of a shelf 2 as shown in Fig. 3. A pair of oppositely disposed straps or links 35 are pivotally connected to the bar 34 as indicated at 36, Fig. 2. The free ends of these straps or links are pivoted at 37 to a cross rod 38. Forward links or straps 39 are also pivoted to the rod 38 at 37, Fig. 2. The forward ends 40 of these latter straps or links are pivoted at 41 to a leaf 42 of a hinge member 43. The other leaf 44 of the hinge member is bent at 45, Fig. 3, to provide a leg or strap 46 which engages an inside face 47 of a door. This leg may be welded or otherwise secured to the inside face of a top rail 5. The hinge is provided with the usual pintle 48 and permits relative turning movement between the door and the equalizer. The equalizer having the two pairs of operatively connected straps or links, causes the door to move evenly and properly and prevents sidewise movement thereof. Therefore, if the door were grasped at one side and pushed, the equalizer would cause the pressure exerted thereagainst to be transmitted equally thus preventing the door from shifting, causing its side edges to remain substantially parallel with the sides of the cabinet.

A clip or ledge 49 may be fastened to the underside of a shelf 2 and this ledge extends forwardly of the front edge 50 of the shelves, Fig. 3. The shelves are bent downwardly and then inwardly and are fastened to the clip or ledge 49 by the fastening means 51. The portion forwardly of the face 50 between the top of the shelf 2 and the top of the clip or ledge 49 provides a pocket or recess 52, Fig. 3, into which the lower part of the door is received. This construction permits the door to close completely the space between shelves and also presents a neat, flush, and ornamental appearance.

A handle 53 may be fixed to the front of a bottom rail, and a bumper 54 may be fastened to the inside of the bottom rail for providing a stop for the door when in closed position.

The side rails 11 are also provided with glass engaging lips 9 for holding the glass 10.

The invention provides a cabinet which completely closes all the space between shelves and the side uprights, and which is practically noiseless in operation. The felt extending from the sides of the doors prevents dust and other foreign material from getting inside of the cabinet, and the equalizer causes the doors to always operate properly and smoothly. The manner in which the doors are hung and the manner in which they overlap the lower shelves presents a very neat appearance. The entire structure can be quickly assembled and can be readily and economically manufactured. All fastening means are hidden from view thereby keeping the exterior of the structure flush and smooth. The doors operate freely and noiselessly, and channels on the inside face of the doors prevent the doors from swinging too high. The bolt which supports the roller also acts to prevent the track from spreading.

Changes may be made in the form, construction, and arrangement of the various parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. A structure comprising spaced uprights, sides between said uprights, shelves between said sides, a pair of tracks connected to a shelf, a door arranged between a pair of shelves, skids on said door and sliding on the tracks to permit sliding movement of the door, means engageable with a part of the skids for limiting the forward sliding movement of the door, a bumper to limit the rearward sliding movement of the door, a member on the structure, and pivoted link members connected to said door and to said member for causing the door to slide evenly on said tracks.

2. In a cabinet construction, upper and lower members, a door between said members, horizontal tracks in the cabinet for sliding the door below the upper member, a skid on each end of said door and sliding in the tracks, said door being adapted to be slid horizontally on the tracks after the door has been moved to a predetermined position, and members fixed to the cabinet and engaged by the skids for swingingly supporting the door at the end of its forward sliding movement, said last named members being fixed and limiting the forward slidable movement of the door.

3. In a cabinet construction, upper and lower members, a projection below each of said members and extending forwardly from the front edges thereof, a door having its upper edge engaging the projection on the upper member to make a tight fit when the door is in closed position, the lower edge of the door lying below the top of the lower member and above the projection thereon.

4. A cabinet comprising spaced uprights, spaced shelves arranged in said cabinet, a door swingingly arranged between shelves and adapted to slide within the cabinet, a pair of links pivotally connected to a part of the cabinet, a longitudinal member pivotally connected to said links, a plurality of other links pivotally connected to said longitudinal member and said first named links, and hinges fastened to said last named links and to said door, whereby the door is swingingly pivoted to said links.

5. A cabinet comprising spaced shelves, a door for closing the space between an upper and a lower shelf, a member rigidly connected inside of the cabinet, a pair of links pivotally connected to said member, a second pair of links, a cross member pivotally connected to the ends of each pair of links, pivot leaf hinges connected to said door and to said last named pair of links, whereby the door is swingingly pivoted to the said links.

6. A cabinet comprising a pair of tracks, guides above said tracks, a door adapted to be slid between the tracks and guides, revoluble rollers fixed to said tracks, skids fixed to said door and engaging the tracks during inward sliding movement of the door, said skids engaging the rollers to limit the forward sliding movement of the door and to swingingly support the door in closed position at the end of the forward sliding movement.

7. A cabinet comprising a pair of tracks, guides above said tracks, a door adapted to be slid between the tracks and guides, revoluble rollers fixed to said tracks, skids fixed to said door and slidingly engaging the tracks during sliding movement of the door, said skids engaging the rollers to limit the forward sliding movement of the door and to swingingly support the door when the door reaches the limit of its forward travel.

8. A cabinet comprising a track, a guide above said track, a door adapted to be slid between the track and guide, a revolubly mounted roller fixed to said track, a skid fixed to said door and engaging the track during sliding movement of the door, said skid engaging the roller to limit the forward sliding movement of the door and to swingingly support the door when the door reaches the limit of its forward travel, a longitudinal horizontal rigid member arranged inside of the cabinet, and pivoted links pivotally connected to the door and fastened to the rigid member to cause the door to slide evenly.

9. A structure comprising spaced uprights, spaced shelves for said structure, a horizontal track between a pair of shelves, a door swingingly arranged between a pair of shelves, a rigid skid fixed to the door and sliding on the top of the track to permit inward horizontal sliding movement of the door after the door is swung to a predetermined position, and a fixed roller mounted on the structure and engageable with a part of the skid when the door is moved to a certain position for limiting the forward sliding movement of the door and for swingingly supporting the door when the door is in closed position.

10. A cabinet comprising spaced uprights, sides between said uprights, shelves between said sides, a track supported by a shelf, a door arranged between a pair of shelves to close the opening between shelves, a rigid skid fixed to said door and sliding on top of the track to permit inward sliding movement of the door between shelves, means engageable with a part of the skid for limiting the forward sliding movement of the door, said means swingingly supporting the door after the door reaches the limit of its forward movement, and a bumper to limit the rearward sliding movement of the door.

11. In a cabinet construction, upper and lower members, a door between said members, tracks for sliding the door below the upper member, a skid on each end of said door and sliding on the tracks, rollers fixed to the cabinet and engaged by the skids for swingingly engaging the door at the end of its forward sliding movement and for limiting the forward slidable movement, means for limiting the rearward sliding movement of the door, a rigid member arranged inside of the cabinet, a pivoted equalizer element arranged in the cabinet, said equalizer element connected to the rigid member, and pivoted means connected to said door and to the equalizer element for causing the door to slide evenly and to prevent side shifting of the door.

12. In a cabinet construction, upper and lower members, a projection below each of said members and extending forwardly from the front edges thereof, a door having its upper edge engaging the projection on the upper member to make a tight fit when the door is in closed position, the lower edge of the door being below the top of the lower member but above the projection thereon, means arranged below the upper member for mounting the door when in closed position, and horizontal means below the upper member for sliding the door inside of the cabinet, said means being substantially parallel with said members.

13. In a cabinet, a door comprising spaced sections, a channel member fixed to one of the sections, a clip member fixed to another section, a screw member passing through the channel member and engaging the clip for holding the sections together, a panel arranged between sections, a skid integral with a part of said channel member, a track mounted interiorly of the cabinet, a guide inside of the cabinet and mounted above the track, said door sliding between said track and guide, the skid engaging the track when the door is between the track and guide, a roller fixed to a part of the cabinet and engaging the skid when the door is slid forwardly a predetermined distance and then swingingly supporting the door.

JAMES E. BALES.
JOHN B. O'CONNOR.