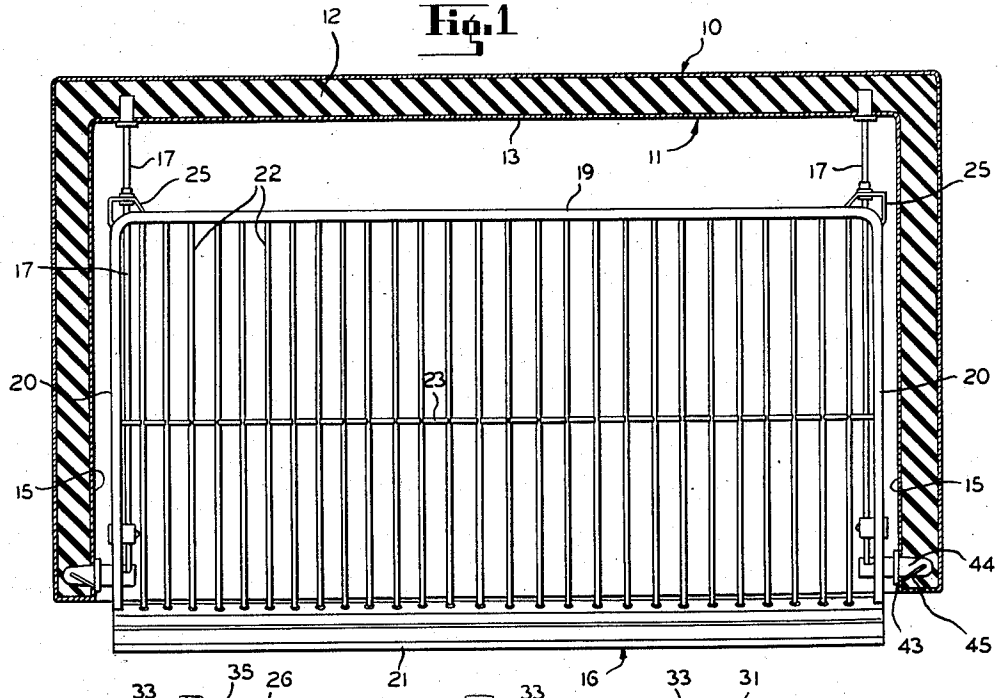
Feb. 3, 1959 C. R. D'OLIVE 2,872,270

SLIDING REFRIGERATOR SHELF

Filed Aug. 6, 1956 2 Sheets-Sheet 1

Fig. 1



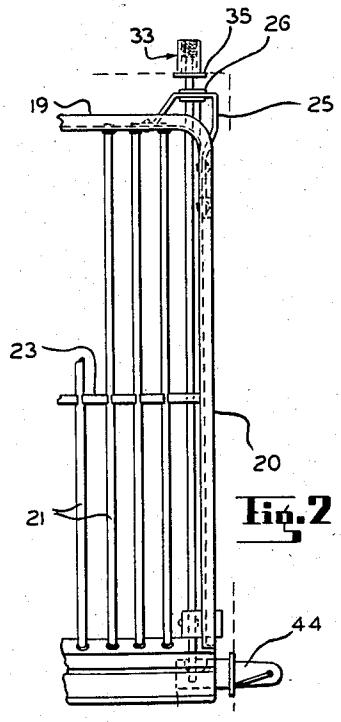


Fig. 2

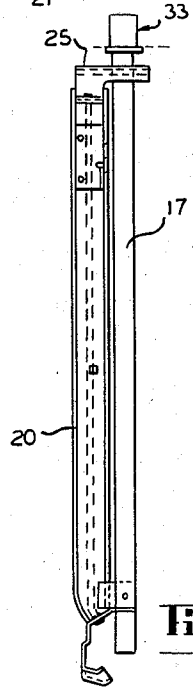


Fig. 3

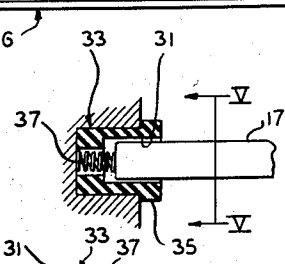


Fig. 4

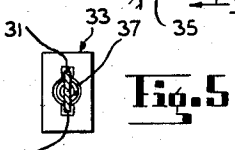


Fig. 5

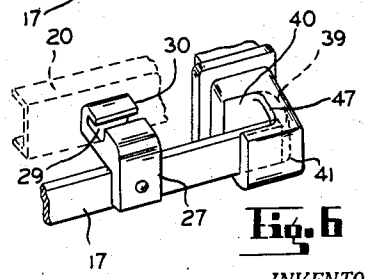


Fig. 6

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SLIDING REFRIGERATOR SHELF

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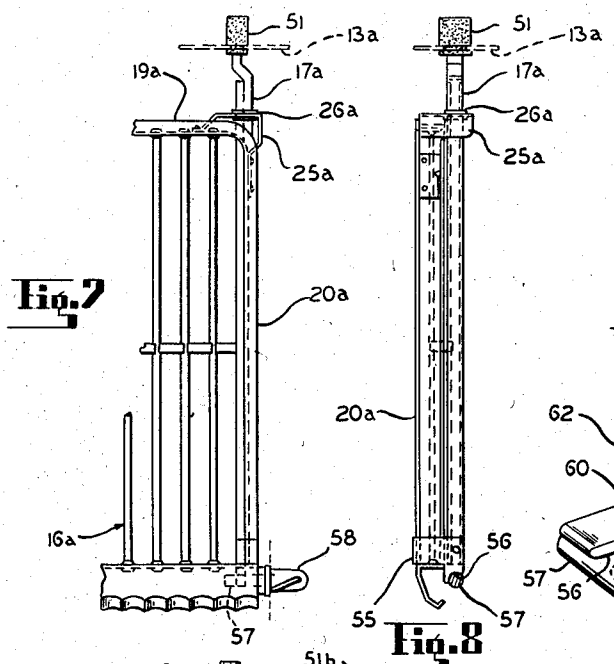


Fig. 7

Fig. 8

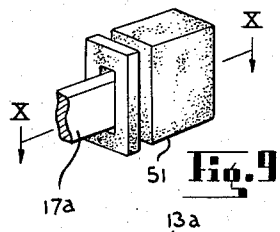


Fig. 9

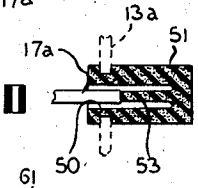


Fig. 10

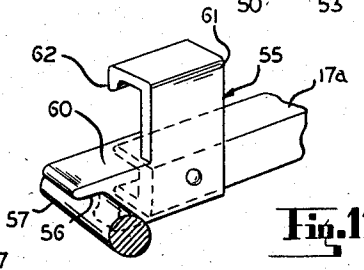


Fig. 11

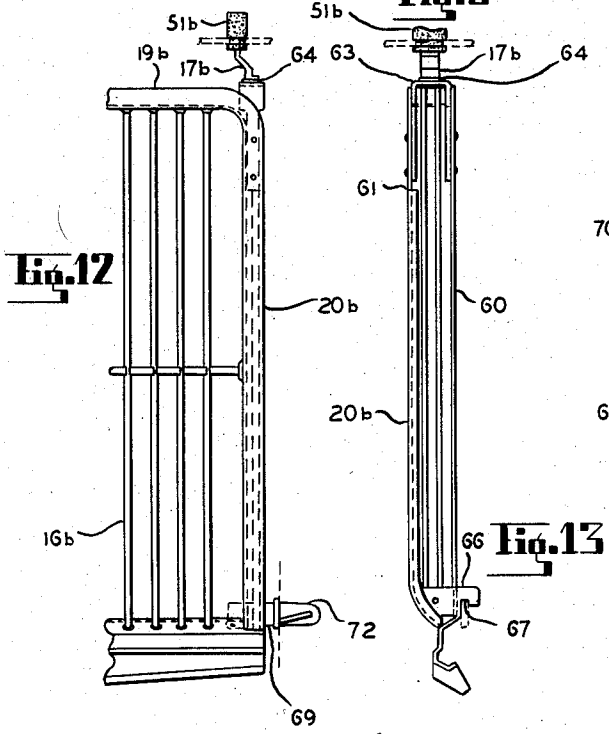


Fig. 12

Fig. 13

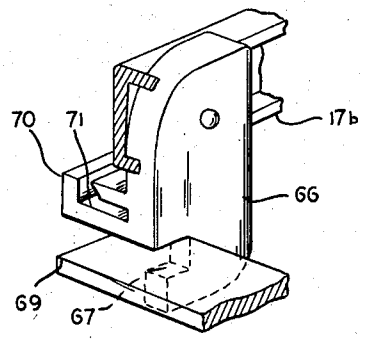


Fig. 14

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SLIDING REFRIGERATOR SHELF

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Application August 6, 1956, Serial No. 602,133

10 Claims. (Cl. 312—332)

This invention relates to improvements in sliding shelves for refrigerators and the like and more particularly relates to a sliding shelf and support therefor compensating for variations in width of the liner of the refrigerator cabinet.

A principal object of the invention is to provide a novel and improved sliding shelf structure conforming to varying widths of refrigerator cabinet liners without adjustment.

A further object of the invention is to provide a sliding shelf structure particularly adapted for refrigerators in which the shelf is slidably supported on two independent bars so mounted as to float in and out with respect to the side walls of the refrigerator cabinet.

A further object of the invention is to provide a sliding refrigerator shelf structure in which the usual transverse bars and support for the shelf have been eliminated and the shelf is supported on two independent bars extending along opposite side walls of the cabinet liner and mounted to freely compensate for variations in width of the cabinet liner with respect to the shelf without binding the shelf.

A still further object of the invention is to provide a refrigerator sliding shelf structure and support therefor in which two independent bars are loosely supported in the rear wall of the cabinet liner of a refrigerator and are yieldably pressed ino engagement at their forward ends with support structures extending outwardly from the side walls of the cabinet liner so as to slide laterally with respect to the walls and conform to variations in width thereof and avoid the necessity of adjusting the shelf support for each individual refrigerator cabinet.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a horizontal sectional view taken through a refrigerator cabinet showing a shelf structure constructed in accordance with the invention therein, and partially withdrawn from the cabinet;

Figure 2 is an enlarged fragmentary detail view of the shelf structure shown in Figure 1 showing the shelf in a retracted position with respect to its support bars;

Figure 3 is a view in side elevation of the refrigerator shelf and support bar therefor shown in Figures 1 and 2;

Figure 4 is an enlarged fragmentary vertical sectional view taken through a socket supporting a rear end portion of one of the shelf support bars;

Figure 5 is a fragmentary sectional view taken substantially along line 5—5 of Figure 4;

Figure 6 is an enlarged fragmentary perspective view illustrating one form of support for the forward end of an independent shelf support bar;

Figure 7 is a fragmentary plan view of a refrigerator shelf and support therefor illustrating a modified form in which my invention may be embodied;

Figure 8 is a view in side elevation of the shelf and support shown in Figure 7;

Figure 9 is an enlarged fragmentary view of a grommet for supporting the rear end portion of a shelf support bar, with the shelf support bar broken away and in section;

Figure 10 is a horizontal sectional view taken substantially along line X—X of Figure 9;

Figure 11 is a fragmentary perspective view illustrating the support for the forward end portion of a shelf support bar having the slide for the shelf thereon;

Figure 12 is a fragmentary plan view of a refrigerator shelf illustrating still another form in which my invention may be embodied;

Figure 13 is a view in side elvation of the shelf and its support; and

Figure 14 is an enlarged fragmentary perspective view illustrating a support for the forward end portion of the shelf support bar and the slide for slidably supporting the shelf thereon.

In Figure 1 of the drawings, I have shown a horizontal section through a refrigerator cabinet including an outer metal wall 10 and an inner wall 11 spaced inwardly from said outer metal wall with the space between said walls filled with a suitable heat-insulating material 12. The walls 10 and 11 are formed to provide a door opening at the front of the cabinet and a food storage compartment within the cabinet. The food storage compartment is genrally rectangular in form and includes a rear wall 13 and oppositely disposed parallel side walls 15 closed by a suitable door (not shown).

A sliding shelf 16 is shown as being slidably supported within the food storage compartment to be slidably withdrawn therefrom, on two independent bars 17 extending along opposite walls 15 of the compartment and mounted for independent floating movement toward and from said walls, to compensate for variations in the width of the liner 11, as will hereinafter more clearly appear as this specification proceeds.

The shelf 16 includes a generally rectangular frame having a back rail 19 generally channel shaped in cross-section with the flanges of the rail facing the back wall 13 of the refrigerator liner. Side rails 20 extend from each end of the back rail 19 along the walls 15 of the refrigerator liner and are herein shown as being formed integrally with the back rail 19 and as being connected together by a front rail 21 so arranged as to afford a hand grip to be gripped by the hand for sliding the shelf out of and into the refrigerator compartment. Parallel spaced rods or wires 22 are shown as extending between the back rail 19 and the front rail 21 and as being riveted or otherwise secured thereto. A cross bar 23 connects the rods 22 together intermediate the ends thereof and is connected at its opposite ends to the side rails 20 to form a stiffener for the wires or rods 21 and maintain said rods in parallel relation with respect to each other.

Brackets 25 are shown as extending rearwardly from each side rail 20 and from the back rail 19 and as being riveted or otherwise secured to the webs of said side and back rails. The brackets 25 depend from the side rails 20 and are shown as having bushings or grommets 26 carried thereby through which the bars 17 extend. The grommets 26 may be generally rectangular in form having rectangular apertured portions through which the bars 17 slidably extend and may be made from a nylon thermoplastic material or from any other suitable material having good bearing characteristics.

Each bar 17 is shown as having a slide 27 riveted or otherwise secured thereto adjacent its forward end and extending outwardly therefrom for interengagement with the lower flange of a side rail 20. The slide 27, as herein shown, extends upwardly along the inner side of the rail 17 and outwardly over the top thereof and has a retaining recess 29 formed therein supporting the bottom of the flange of a side rail 20 and having an inwardly extending gib 30 extending over the top of the flange to

retain the rail 20 to the bar 17 and prevent upward lifting movement of said rail with respect to said bar.

Each bar 17 is shown as loosely extending within a generally rectangular socket 31 formed in a support member 33 mounted in the back wall 13 of the refrigerator liner and extending within the insulation 12. As herein shown the support 33 is generally rectangular in form although it may be of any suitable form and has a flange 35 engaging the back wall 13 and limiting inward movement of the support 33 with respect to the liner of the refrigerator cabinet. A compression spring 37 is shown as being carried in the support 33 and as extending within the socket 31 thereof, and engaging the rear end of the bar 17 and biasing said bar into engagement with a face 39 of a socket 40 formed in a support bracket 41 mounted in a side wall 15 of the refrigerator liner and extending outwardly therefrom.

The support bracket 41 may be made from a thermoplastic material such as nylon or a like material and is herein shown as extending outwardly from a fastener 42 for securely fastening said support bracket to the wall 15 of the refrigerator cabinet and known to the trade as a Simmons fastener. Such fasteners have a flange 43 abutting the outside of the wall to which they are secured with a pin 44 extending inwardly within the wall having a deformable wire 45 extending through the inner end of the pin and outwardly along opposite sides thereof into engagement with the inside of the wall and deformable upon twisting the fastener to permanently retain the fastener to the wall.

The socket 40 in the support bracket 41 is shown as opening toward the bar 17 to receive the end of said bar and as having a gib 47 extending from the wall 39 inwardly over the end of the bar to normally prevent removal of the bar by upward lifting movement thereof, but to accommodate removal of the bar 17 and a shelf thereon by inward pressing movement of said bar against the compression spring 37 in the support 35 until the forward end of the bar clears the gib 47.

The face 39 of the socket 40 is herein shown as being of an arcuate or curved form, the arc of which is struck from a vertical axis, and as being engaged by the forward end of the bar 17, pressed into engagement therewith by the spring 37. The curvate face or wall thus accommodates side movement of the bar 17 with respect to the side wall 15 of the refrigerator liner and serves to maintain the bar 17 in the vertically extending position shown in Figure 6 and to relieve said bar from any stresses which would tend to cause binding between the bushing 26 and slide 27, with a resultant restriction in slidable movement of the shelf 16 as it is slid outwardly from or inwardly with respect to the food storage compartment of the refrigerator.

In the form of my invention illustrated in Figures 7 to 11 inclusive, a shelf 16*a* like the shelf 16 has a back rail 19*a* and parallel spaced side rails 20*a* mounted for slidable movement along support bars 17*a*. Each support bar 17*a* extends through a nylon bearing or grommet 26*a* mounted in a bracket 25*a* extending rearwardly from a rail 20*a*. The support bar 17*a* is loosely mounted at its rear end in a recess 50 formed in a grommet 51, which may be made from rubber or one of the well known substitutes for rubber, and which is pressed into engagement with an apertured portion of a rear wall 13*a* of the refrigerator liner. The recess 50 is shown as being rectangular to conform to the form of the bar 17*a* and as having a projection or plug 53 extending therealong from the inner end thereof in inwardly spaced relation with respect to the walls of said recess. The plug 53 engages the inner end of the bar 17*a* and biases said bar outwardly with respect to the grommet 51.

At the forward end of the bar 17*a* and projecting forwardly therefrom is a slide 55 which may be riveted or otherwise secured to said bar and extends inwardly and upwardly therefrom. The forwardly projecting portion of the slide 55 is shown as having a forwardly facing arcuate recess 56 formed therein, pressed into engagement with a pin 57, which may extend outwardly from a Simmons fastener 58 secured to a side wall of the refrigerator cabinet.

The slide 55 is shown as having a plane sliding surface 60 having slidable engagement with the underside of a flange of a channel-like side rail 20*a* and as having a portion 61 extending upwardly along the outside of the rail 20*a* and over the upper flange of said rail. A gib 62 extends downwardly from the portion of the slide extending over the upper flange of the rail to slidably engage the inner side of said flange and limit lateral movement of said slide with respect to said rail.

In this form of the invention the slide 60 is pressed into interengagement with the pin 57 by the yieldable extension or plug 53 and is free to slide laterally along the pin 57 to compensate for variations in width of the cabinet liner and thus render it unnecessary to adjust the rail 17*a* to varying widths of cabinet liners.

In the form of the invention illustrated in Figures 12, 13 and 14, I have shown a shelf 16*b* having a back rail 19*b* and parallel spaced channel-like side rails 20*b* forming right angled continuations of the back rail 19*b*. Each side rail 20*b* is slidably mounted on a bar 17*b*, shown as being channel shaped in cross section and as extending between lower and upper flanges 60 and 61 respectively of the side rail 20*b*. A generally U-shaped bracket 63 is riveted or otherwise secured at its legs to the flanges 60 and 61 and extends along said flanges beyond the rear end of the back rail 9*b* and has a bearing or grommet 64 carried in the rear end portion thereof. The grommet 64 may be made from nylon or a like material and forms a bearing supporting the rear end of the shelf 16 for slidable movement along the bar 17*b*. The bar 17*b* has a rectangular rear end portion 65 loosely carried in a grommet 51*b* and pressing the bar 17*b* toward the forward end of the cabinet.

The bar 17*b* has a nylon slide 66 riveted or otherwise secured to its forward end and depending therefrom. The depending portion of the slide 66 has a forwardly opening recess 67 formed therein conforming to the faces of a support bar 69 and supported on said bar for limited slidable movement therealong. The bar 69 may be formed integrally with and extend laterally from a Simmons fastener 72 mounted in a side wall of the refrigerator. The nylon slide 66 likewise has an inwardly extending slide portion 70 having a generally L-shaped recess 71 formed therein slidably engaging the bottom flange 60 of the side rail 20*a* and the inner side of the web of said side rail. The slide is sufficiently resilient that the bottom flanges of the rail may be snapped within the L-shaped recess 71 and be supported and guided thereby for slidable movement therealong.

It will be understood that modifications and variations in the present invention may be effected without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. In a refrigerator, a cabinet having a liner having a rear wall and parallel spaced side walls extending therefrom, a sliding shelf within said cabinet, and means for supporting said shelf for free slidable movement with respect to said cabinet comprising two independent bars extending along opposite side walls of said cabinet, sockets in the rear wall of said cabinet having said bars loosely mounted therein and including resilient means biasing said bars toward the forward end of said cabinet, and individual supports for the forward ends of said bars accommodating independent lateral slidable movement of said bars with respect to the side walls of said cabinet, and retaining said bars from movement along said side walls toward the outer ends thereof.

2. In a refrigerator, a cabinet having a rear wall and parallel spaced side walls, a sliding shelf within said

cabinet, and means for supporting said shelf for free slidable movement with respect to said cabinet, comprising two independent bars extending along opposite side walls of said cabinet, sockets in the rear wall of said cabinet loosely carrying the rear ends of said bars and having springs therein biasing said bars toward the front of said cabinet, and individual supports for the forward ends of said bars mounted on the side walls of said cabinet and having interengagement with said bars to retain said bars from vertical movement with respect to said cabinet and accommodating side floating movement of said bars with respect to the walls of said cabinet to compensate for variations in the width thereof.

3. In a refrigerator, a cabinet having a liner having a rear wall and parallel side walls, a sliding shelf, and means for supporting said shelf for free slidable movement with respect to said cabinet comprising two independent bars extending along opposite side walls of said cabinet, socket means in the rear wall of said cabinet loosely carrying the rear ends of said bars and biasing said bars toward the front wall of said cabinet, and individual supports for the forward ends of said bars comprising socket members extending outwardly from the side walls of said cabinet having sockets therein for receiving said bars and extending partially over the ends thereof and also having curvate vertically extending faces engageable with the forward ends of said bars and accommodating side floating movement of said bars with respect to said walls to compensate for variations in width of the cabinet liner.

4. In a refrigerator, a cabinet having a liner having a rear wall and parallel side walls, a sliding shelf, and means for supporting said shelf for free slidable movement with respect to said cabinet and compensating for irregularity in the width of said liner comprising two independent bars extending along opposite side walls of said cabinet, resilient sockets in the rear wall of said cabinet carrying the rear ends of said bars and accommodating lateral movement of said bars with respect to said sockets and including resilient means biasing said bars toward the forward end of said cabinet, and individual supports for the forward ends of said bars having interengagement therewith and retaining said bars from vertical movement and movement along said side walls toward the outer ends thereof but accommodating independent lateral floating movement thereof toward and from the side walls of said cabinet.

5. In a refrigerator, a cabinet having a liner having a rear wall and parallel side walls, a sliding shelf, and means for supporting said shelf for free slidable movement with respect to said cabinet and compensating for irregularity in the width of said liner comprising two independent bars extending along opposite sides of said cabinet, resilient sockets in the rear wall of said cabinet for the rear ends of said bars and accommodating lateral movement of said bars with respect to said sockets and biasing said bars toward the forward end of said cabinet, individual supports for the forward ends of said bars comprising pins extending laterally from the side walls of said cabinet, and slides for said shelf on the forward ends of said bars having interengagment with said pins, retaining said bars from vertical movement with respect to said pins and accommodating side floating movement of said bars along said pins.

6. In a refrigerator, a cabinet having a liner having a rear wall and parallel side walls, a sliding shelf, and means for supporting said shelf for free slidable movement with respect to said cabinet, comprising two independent bars extending along opposite side walls of said cabinet, resilient sockets in the rear wall of said cabinet loosely carrying the rear ends of said bars and accommodating lateral movement of said bars with respect to said sockets and pressing said sockets toward the forward end of said cabinet, and individual supports for the forward ends of said bars comprising rectangular socket members projecting laterally from the side walls of said cabinet having sockets therein facing said bars for receiving the same and retaining said bars from vertical movement, said socket members having curvate vertically extending faces facing the ends of said bars and engaged thereby and accommodating side floating movement of said bars along said faces about said resilient sockets in the rear wall of said cabinet.

7. In a refrigerator, a cabinet having a liner having a rear wall and parallel spaced side walls, a sliding shelf having parallel spaced channel like rails forming the side rails of the shelf and having vertically spaced flanges, and means for supporting said shelf for free slidable movement with respect to said cabinet comprising two independent bars extending along opposite side walls of said cabinet, resilient sockets in the rear wall of said cabinet for the rear ends of said bars and accommodating lateral movement of said bars with respect to said sockets and pressing said bars toward the forward end of said cabinet, individual supports for the forward ends of said bars comprising pins extending laterally from said side walls, bearing slides secured to the ends of said bars and projecting forwardly therefrom and having slots therein having interengagement with the flanges of said side rails, and also having recessed portions facing said pins and having lateral floating engagement therewith.

8. In a refrigerator, a cabinet having a liner having a rear wall and parallel spaced side walls, a sliding shelf having a back rail and parallel spaced channel like side rails having vertically spaced horizontally extending flanges, and means for supporting said shelf for free slidable movement with respect to said cabinet comprising two independent bars, bearing bushings secured to said side rails and forming a support for the rear end portion of said shelf on said bars, sockets in the rear wall of said cabinet loosely carrying the rear ends of said bars and biasing said bars toward the front wall of said cabinet, bearing slides secured to the forward ends of said bars and having slots extending therealong having interengagement with the flanges of said side rails, and socket members projecting laterally from the side walls of said cabinet for receiving the forward ends of said bars and retaining said bars from vertical movement with respect to said side walls and having vertically extending curvate faces engaged by the ends of said bars and accommodating lateral floating movement of said bars with respect to the walls of the cabinet.

9. In a refrigerator, a cabinet having a liner having a rear wall and parallel side walls, a sliding shelf having a back rail and parallel channel like side rails having vertically spaced horizontally extending flanges, and means for supporting said shelf for free slidable movement with respect to said cabinet, comprising two independent bars extending along opposite side walls of said cabinet, sockets in the rear wall of said cabinet loosely carrying the rear ends of said bars and having springs therein yieldably biasing said bars toward the front wall of said cabinet, nylon bushings carried by said side rails adjacent the rear end thereof and having said bars extending therethrough, individual socket members at the forward ends of said side walls having sockets therein facing said bars and receiving the same and retaining said bars from vertical movement with respect to said side walls and having vertically extending curvate faces engaged by the ends of said bars and accommodating side floating movement of said bars about said sockets in the rear wall of said cabinet to compensate for irregularities in the width of the cabinet liner.

10. In a refrigerator, a cabinet having a liner having a rear wall and parallel side walls, a sliding shelf having a back rail and parallel side rails of a channel like cross section having vertically spaced horizontally extending flanges, bearing bushings supported at the rear ends thereof said side rails, and means for supporting

said shelf for free slidable movement with respect to said cabinet comprising two independent bars extending through said bushings along opposite side walls of said cabinet, resilient sockets in the rear wall of said cabinet supporting the rear ends of said bars and accommodating lateral movement of said bars with respect to said sockets and pressing said bars toward the forward end of said cabinet, nylon slides secured to the forward ends of said bars and having slots extending horizontally therealong having interengagement with the flanges of said side rails, said slides also having forwardly opening recessed forward end portions, and pins projecting from opposite side walls of said cabinet and being engaged by said forwardly opening recessed portions for retaining said bars from vertical movement with respect to said pins, but accommodating lateral floating movement of said bars along said pins to compensate for irregularities in the width of the cabinet liner.

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