

Sept. 23, 1952

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2,611,675

SHELF ARRANGEMENT FOR REFRIGERATORS OR THE LIKE

Filed May 9, 1947

4 Sheets-Sheet 1

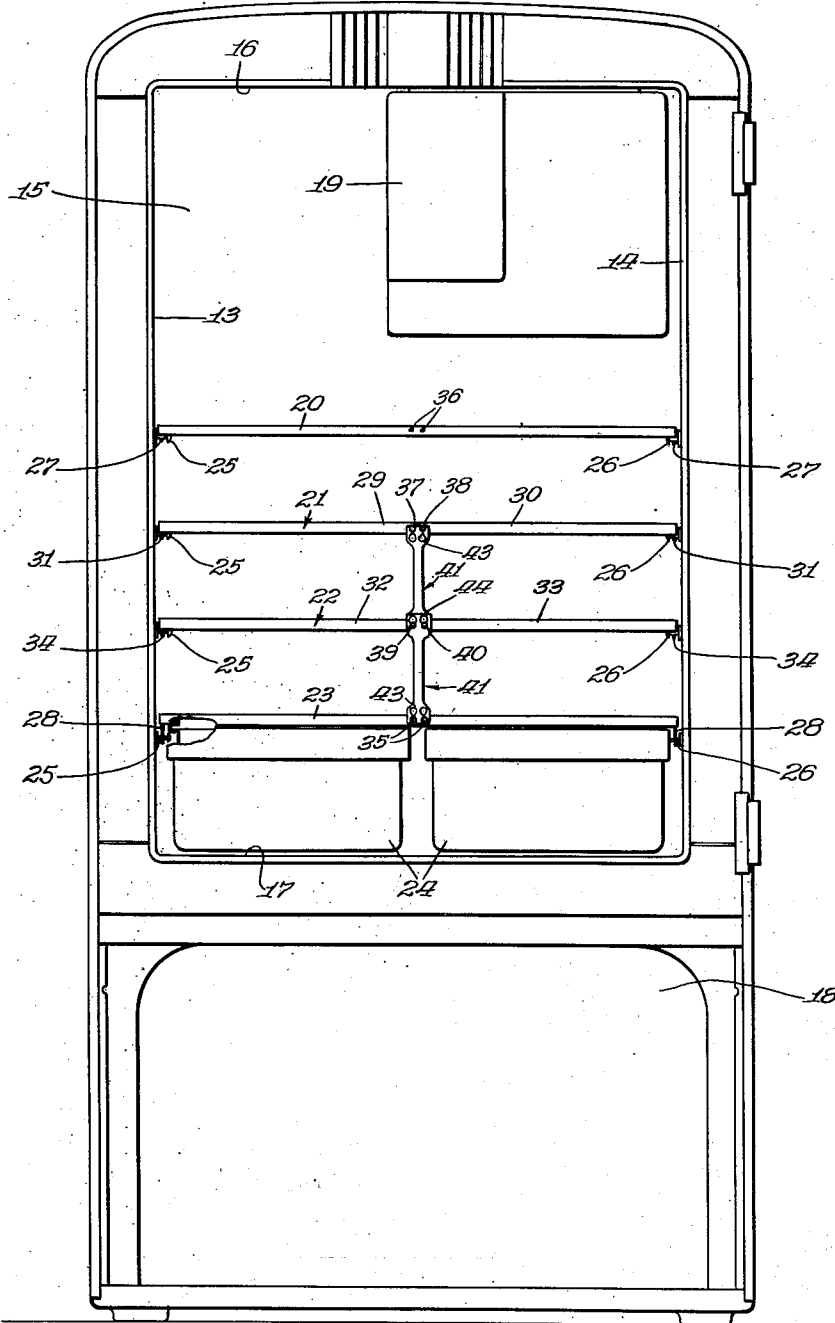


Fig. 1.

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4 Sheets-Sheet 2

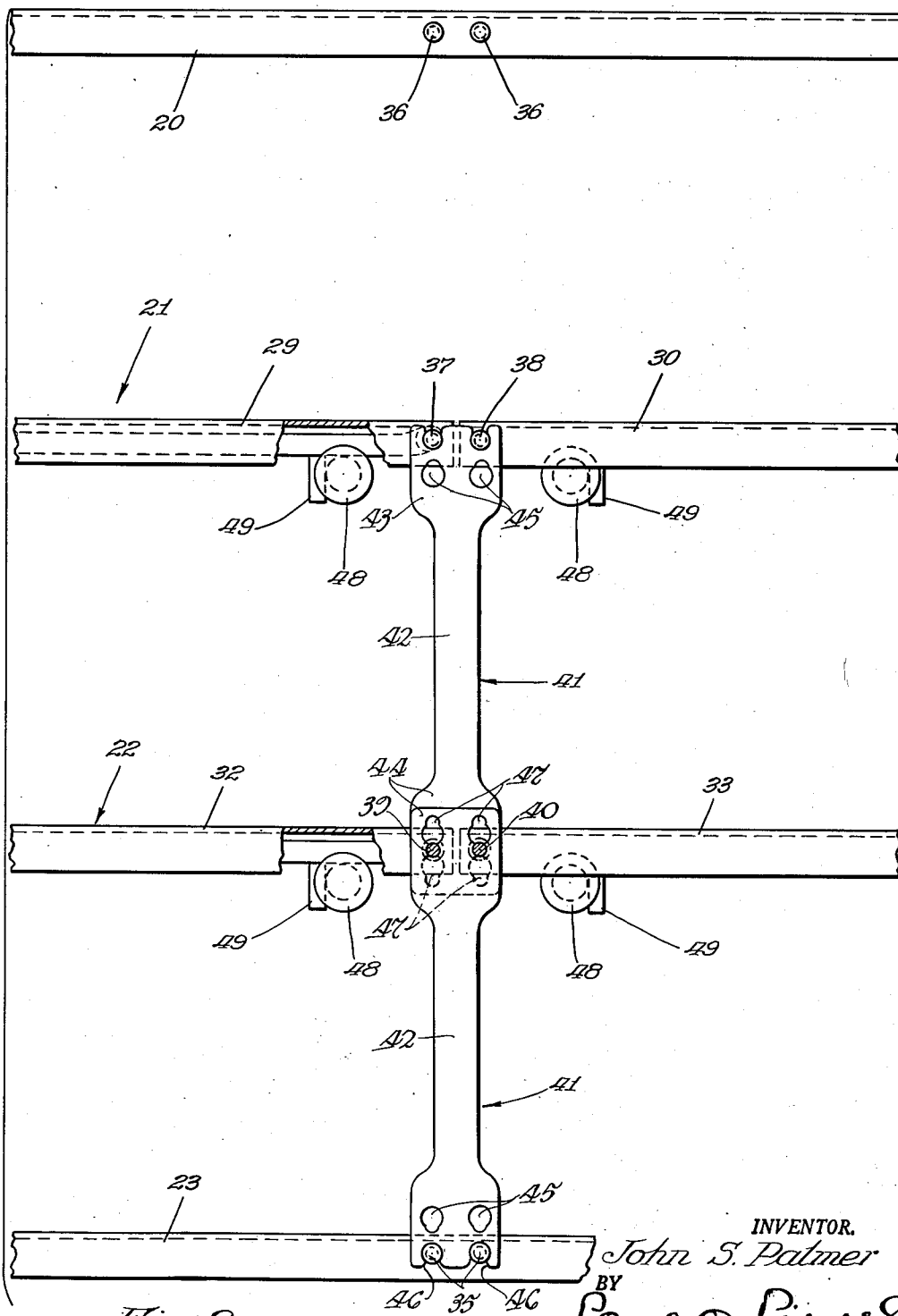


Fig. 2.

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4 Sheets-Sheet 3

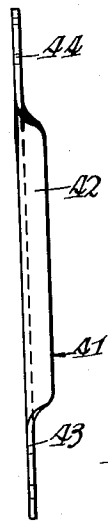
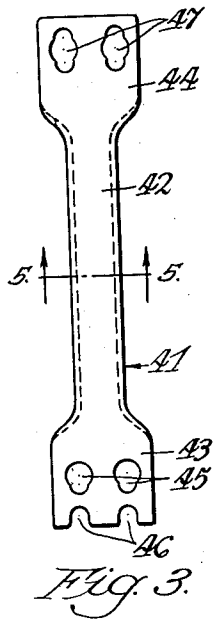


Fig. 4.

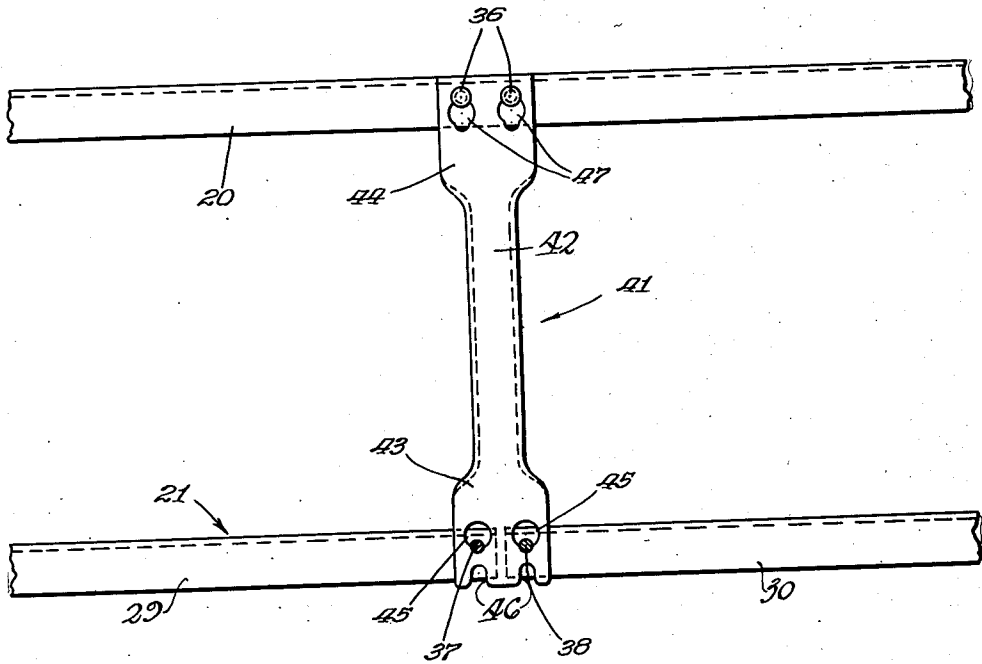
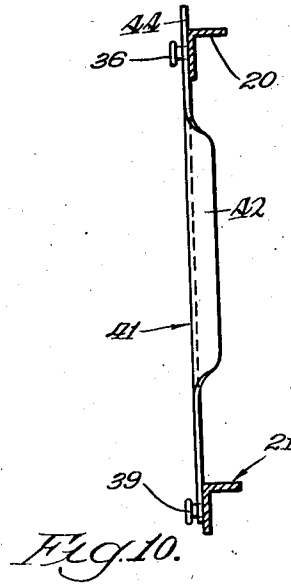


Fig. 11.

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4 Sheets-Sheet 4

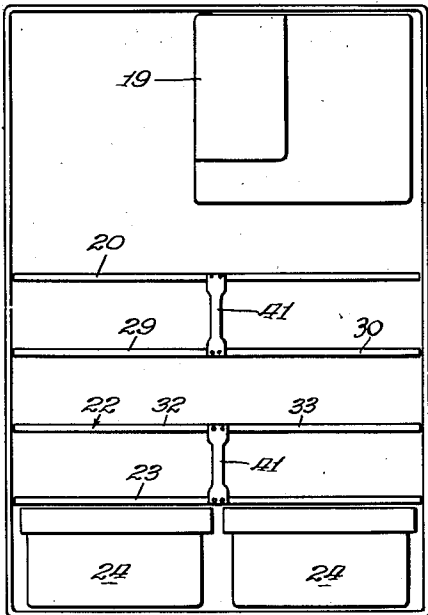


Fig. 6.

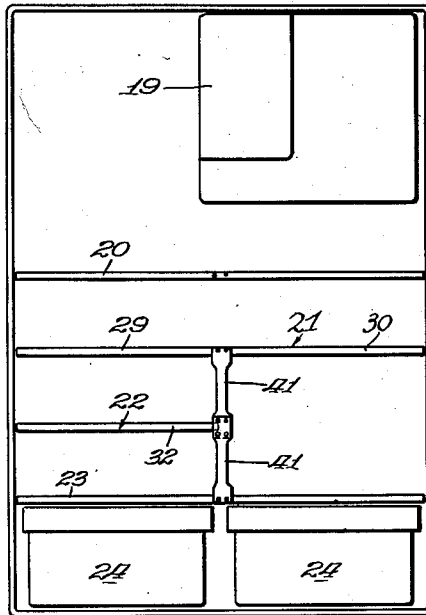


Fig. 7.

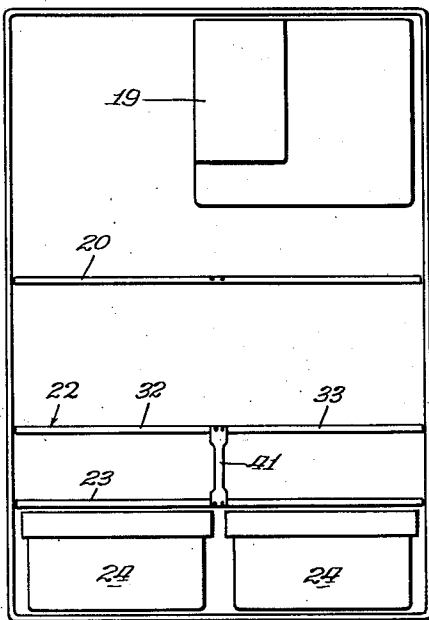
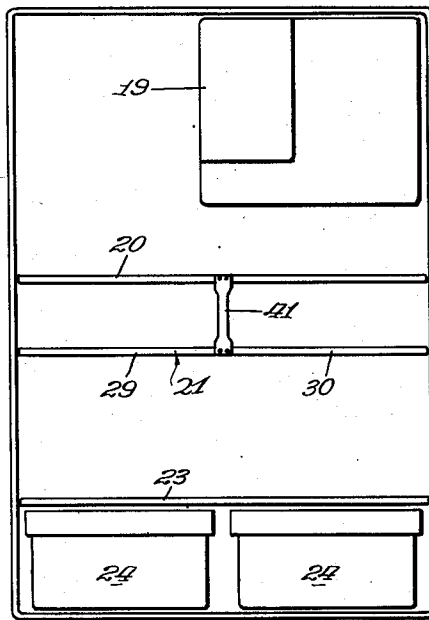


Fig. 8.



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# UNITED STATES PATENT OFFICE

2,611,675

## SHELF ARRANGEMENT FOR REFRIGERATORS OR THE LIKE

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Application May 9, 1947, Serial No. 746,915

3 Claims. (Cl. 312-351)

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This invention relates to a shelf arrangement or construction for cabinets or the like. The invention pertains more particularly to improvements in the shelf arrangements of household refrigerators.

The conventional household refrigerator is somewhat limited in size as to its capacity for receiving and storing foods. Further limitations on the ability of the refrigerator to accommodate foods and the various receptacles in which they are placed are imposed by the size and location of the evaporator. Most refrigerators are provided with a plurality of horizontal shelves rather closely spaced apart vertically and located below the evaporator. The evaporator is usually positioned at the top of the food storage compartment, either centrally thereof or to one side. It is common practice to provide for the storage of tall receptacles, such as bottles or the like, in the space at one side of the evaporator. In such constructions, housekeepers are always faced with the problem of how to store food items of large size, such as water melons, fowl and various foods stored in large receptacles, such as gallon containers, casseroles and the like.

Accordingly it is an important object of the present invention to provide in a household refrigerator an improved shelf arrangement characterized in that certain of the shelves are provided as separable sections which may be removed singly or in numbers to accommodate various food storage problems without interfering with the support of shelf sections left in the food storage compartment. It is another object of the invention to provide the removable shelf sections as symmetrical units which may be disposed at different levels in the cabinet and which may be associated in position with other shelf sections either thereabove or therebelow. A still further object is to provide supporting means for the shelves of such nature as to accommodate the various shelf arrangements, and particularly to be of such construction as to support certain shelf sections from below or to suspend certain shelf sections from above. Other objects of the invention are: to make the supporting members of light weight and simple construction; to provide supporting elements thereon which adapt the supporting members for reversal or interchangeability; and to provide a shelf arrangement that is relatively inexpensive, easily adaptable to the ordinary housekeeper, and providing for wide flexibility in the storage of foods in the refrigerator cabinet.

The foregoing and other important objects and

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desirable features of the invention are set forth in detail in the following description and accompanying sheets of drawings, in which:

5 Figure 1 is a front view of a typical household refrigerator showing the improved shelf arrangement with the parts in what may be termed their normal positions, the door of the refrigerator being removed to expose the food compartment and shelf arrangement.

10 Figure 2 is an enlarged fragmentary view emphasizing the relationship between the shelves and the supporting means therefor, portions of the intermediate shelves being broken away to show the rear supports therefor.

15 Figure 3 is a front view of the supporting member per se.

Figure 4 is a side view of the same.

20 Figure 5 is a transverse sectional view showing the channel construction of the supporting member, the view being taken on the line 5-5 of Figure 3.

Figures 6 to 9 inclusive are schematic views illustrating the various shelf arrangements obtainable according to the present invention.

25 Figure 10 is an enlarged sectional view showing the association between the supporting member and a pair of vertically spaced shelf units.

30 Figure 11 is a fragmentary view showing the use of the supporting link when one shelf unit is supported from a shelf unit above.

Although the drawings and the description to follow point to the use of the shelf construction in connection with household refrigerators, it should be understood that the principles of the invention have wider application and may find use in other instances. Accordingly, the present disclosure should be taken as illustrative and not limiting.

35 For the purposes of the present description, there has been shown in the drawings a household refrigerator comprising a cabinet having opposite vertical side walls 13 and 14, a rear wall 15, and top and bottom walls 16 and 17 respectively. These walls delineate a food storage compartment. The cabinet may include the usual outer structure and may further include a lower compartment 18 normally closed by a door (not shown), within which compartment may be located the usual refrigerating machinery (not shown). The food storage compartment may be cooled by an evaporator, such as indicated at 19 in Figure 1.

40 As shown in Figure 1 the food storage compartment is subdivided by a plurality of shelf structures including an upper one-piece shelf 20,

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a second or two-piece shelf 21, a third split shelf 22, and a lower one-piece shelf 23. The space below the shelf 23 provides for the accommodation of crispers or hydrators 24. The side wall 13 of the food storage compartment is provided with a plurality of supporting members, here shown as headed pins 25. It will be understood that there are at least a pair of pins in horizontal alinement for each shelf and a similar arrangement is provided at the opposite wall 14, there being a plurality of headed pins 26.

The upper shelf 20 is provided at each of its outer or wall-adjacent edges with depending lugs 27 which cooperate with the pins 25 and 26 to prevent forward displacement of the shelf 20. The outer or wall-adjacent edges of the lower shelf 23 are provided with similar lugs 28 for engaging the lower pins 25 and 26. Insofar as the support of the outer edges of the shelves 20 and 23 is concerned, the construction may be of any type, the particular form of construction shown here being only representative and comprising no part of the present invention.

The shelf unit 21 comprises a pair of separable shelf sections 29 and 30, the outer or wall-adjacent edge of each of which is provided with depending lugs 31 for association with the pins 25 and 26 in a manner similar to the association of the lugs 27 on the shelf 20 with the upper pins 25 and 26. The inner edges of the shelf sections 29 and 30 are closely spaced apart, as will be apparent. The shelf unit 22 is similar to the shelf unit 21 and comprises a pair of similar shelf sections 32 and 33 supported on the next lower sets of pins 25 and 26 by means of depending lugs 34.

The lower shelf 23 is provided at a central portion of the front edge thereof with a pair of forwardly projecting supporting elements preferably in the form of headed pins 35. The upper shelf 20 is provided with a pair of similar supporting elements 36. The shelf section 29 of the shelf unit 21 is provided at its front edge adjacent its inner edge with a supporting element in the form of a headed pin 37 preferably identical to the pins 35 and 36. The shelf section 30 is provided with a similar pin 38. The shelf sections 32 and 33 of the shelf unit 22 are provided with similar pins 39 and 40 respectively. These pins, as will be hereinafter more clearly brought out, form part of the means for supporting the shelves in various positions in the food storage compartment.

A further part of the supporting means includes a supporting member or link, shown by itself in Figure 3. The link is generally designated by the reference character 41 and includes an elongated body portion 42 preferably formed as a channel in cross-section (Figure 5) and has its opposite ends flattened, one end being designated by the numeral 43 and the other by the numeral 44. The end 43 of the link 41 is provided with a pair of openings 45, which openings are preferably in the form of keyhole slots. One edge of the end portion 43 is provided with a pair of notches 46. The other end of the link is provided with a pair of similar openings 47, each of which is preferably in the form of a double keyhole slot.

The links 41 support the shelf units 21 and 22, or the components thereof, at their forward edges, a detailed description of which will follow. The rear edges of the shelf sections 29, 30, 32, and 33 are supported at the rear wall 15 of the food storage compartment by means of headed

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pins 48 and depending lugs 49 on the shelf sections (Figure 2).

As shown in Figure 1, the shelf unit 22 is supported above the lower shelf 23 by means of a link 41. In this arrangement of the shelves the link 41 has its end 43 down and its end 44 up. The notches 46 in the end 43 engage the pins 35 on the shelf 23. The double keyhole slots 47 accommodate the pins 39 and 40 of the shelf sections 32 and 33 respectively, the pins 39 and 40 resting, of course, at the lower edges of the slots. The link 41 is, in this position, under compression as it supports the shelf 22 from below.

A second link 41 is positioned between the shelf units 21 and 22 with its end 43 up and its end 44 down, so that the notches 46 receive the pins 37 and 38 of the shelf sections 29 and 30 respectively, and so that the keyhole slots 47 in the end 44 receive the pins 39 and 40 of the shelf sections 32 and 33 respectively. In the drawings the upper link 41 is shown as having been connected to the shelves 21 and 22 before the lower link has been connected to the shelves 22 and 23. The particular arrangement is immaterial and either may be positioned before the other. As stated heretofore, the shelf unit 22 is supported from below on the shelf 23 by means of the link 41. Similarly, the shelf unit 21 is supported from below on the shelf unit 22 by means of the second link 41. Inasmuch as the shelf 20 is of one piece, it is not necessary to use a link between that shelf and the shelf unit 21 in the shelf arrangement shown in Figure 1.

According to the present invention various shelf arrangements are possible with the elements set forth, so that the shelves may be variously positioned or may be removed so as to vary the spacing between the shelves.

Figure 6 shows an arrangement of the shelves in which the shelf unit 21 is suspended from the upper shelf 20 by means of a link 41 and in which the shelf unit 22 is supported from below by means of a second link 41. It will be noted that the link has been removed from between the shelves 21 and 22, thus affording a wide unobstructed storage space between these two shelves. When the link 41 is used to suspend one shelf unit from another, it is positioned as shown in Figure 11, with its end 44 up and its end 43 down. In this position the double keyhole slots 47 receive the pins 36 on the shelf 20, and the keyhole slots 45 at the end 43 of the link receive the pins 37 and 38 of the shelf sections 29 and 30 respectively. It will be understood, of course, that the link 41 may be positioned for suspension between the shelf 21 and the shelf 22, in which event the link is positioned in a manner similar to that shown in Figure 11.

Figure 7 shows an arrangement in which the shelf section 33 has been removed so as to provide a larger space between the lower shelf 23 and the shelf section 30. The removal of any shelf section does not interfere with the support of the other shelf sections, inasmuch as the inner ends of the shelves are not supported on each other.

In Figure 8 the entire shelf unit 21 and associated link 41 have been removed.

In Figure 9 the entire shelf section 22 and associated links 41 have been removed, and one of the links is utilized for suspending the shelf unit 21 from the shelf 20.

It will be understood, of course, that still other arrangements are possible. For example, all the shelf sections 29, 30, 32, and 33 and both links 41 may be removed. Either of the shelves 20 or 23

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may be removed if any of the other shelf sections are to remain, inasmuch as it requires one or the other of the shelves 20 or 23 to support the shelf sections, either by suspension from above or by tension on the link from below.

The foregoing description of the various arrangements obtainable according to the shelf construction provided by the present invention is set forth as representative of the flexibility of the arrangement provided. Other arrangements are possible and will occur to the user according to the storage problems encountered.

It is not desired that this invention be limited to the exact details of construction shown and described, for obviously many modifications and alterations may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. For use with a shelf arrangement of the class described, a link comprising: an elongated member having an intermediate portion of channel cross-section and provided at opposite ends with integral flat portions; means providing keyhole openings through the flat portions; and means providing notches in an edge of at least one of said flat portions.

2. A shelf construction for a cabinet or the like having spaced apart, vertical side walls, comprising: a first shelf extending across the cabinet between the side walls thereof; means supporting the wall-adjacent edges of the shelf on the walls; a second shelf paralleling the first vertically spaced therefrom and including a pair of separable sections; means removably supporting the wall-adjacent edges of the second shelf sections on the walls, the inner edges of said sections being closely spaced apart; forwardly projecting pin means at the front edge of the first shelf proximate a central portion thereof providing a supporting element; means on the front edge of each section adjacent the inner edge thereof including a forwardly projecting pin, said shelf section pins being substantially in vertical alignment with the pins on the first shelf; and means for supporting the inner edges of the second shelf sections from the first shelf, including a supporting link member having openings at one end to receive the first shelf pins and a pair of openings and a pair of slots at the other end whereby in one position the latter openings receive the pins of the sections and support said sections below the first shelf and in another position the slots receive the pins of

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the sections and support said sections above the first shelf.

3. A shelf construction for a cabinet or the like having spaced apart vertical side walls, comprising; a first shelf extending across the cabinet between the side walls thereof; means supporting the wall-adjacent edges of the shelf on the walls; means at the front edge of the shelf at a central portion thereof including forwardly projecting pins; a second shelf paralleling the first shelf and including a pair of separable sections; means removably supporting the wall-adjacent edges of the second shelf sections on the walls, the inner edges of said sections being closely spaced apart; means on the front edge of each section adjacent the inner edge thereof including a forwardly projecting pin, said shelf section pins being generally in vertical alinement with the pins on the first shelf; means for supporting the inner edges of the second shelf sections on the first shelf, including an independent and reversibly positionable supporting member having openings at one end to receive the first shelf pins and a pair of openings at the other end to receive the pins on the sections and being adaptable for use in one position in tension and in another position in compression; and having said inner edge supporting means constructed and arranged to support either shelf section separately whereby the remaining shelf section may be supported after one shelf section has been removed.

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