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J. T. WHALEN

2,064,096

SHELF SUPPORT

Filed June 20, 1935

2 Sheets-Sheet 1

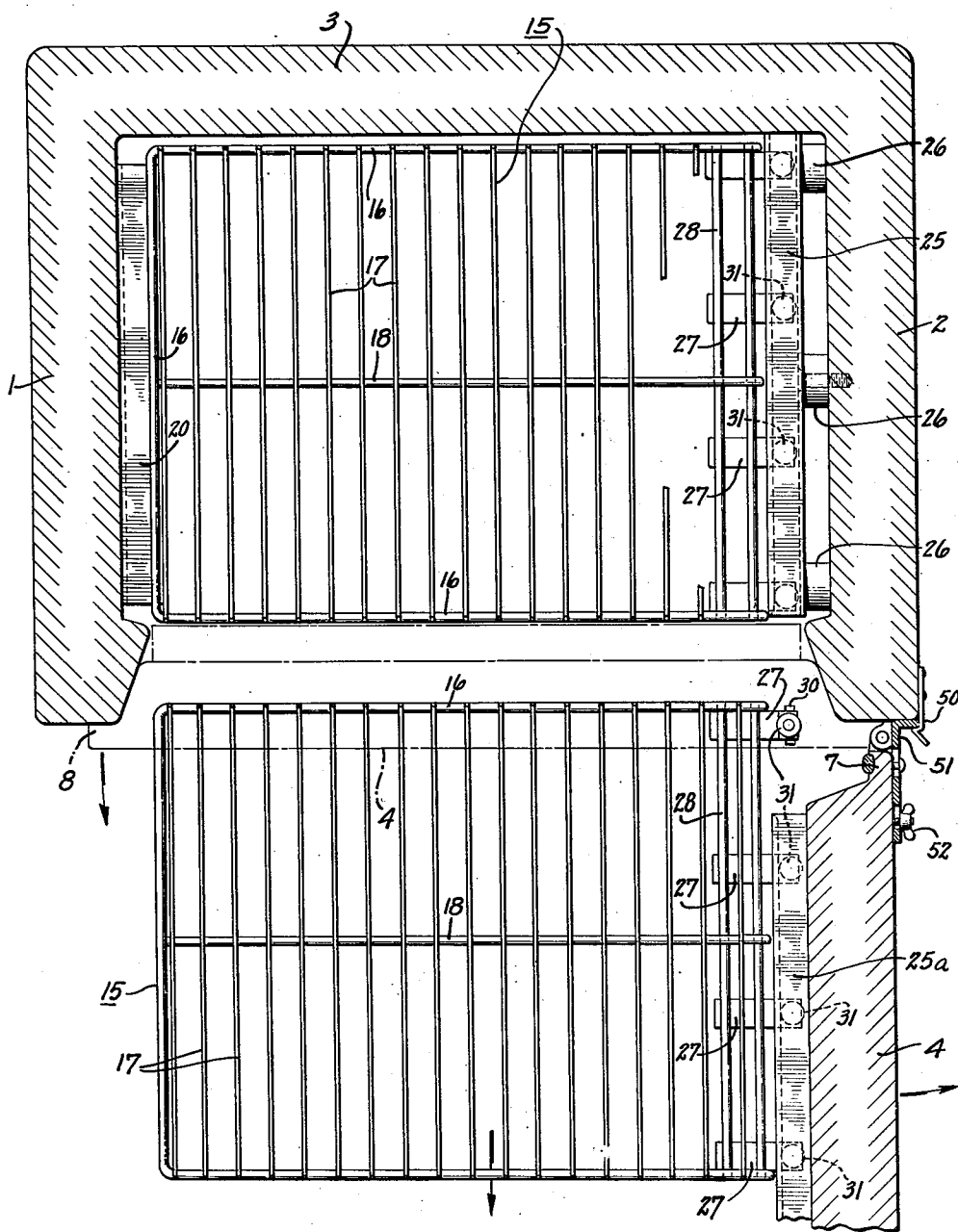


Fig. 1.

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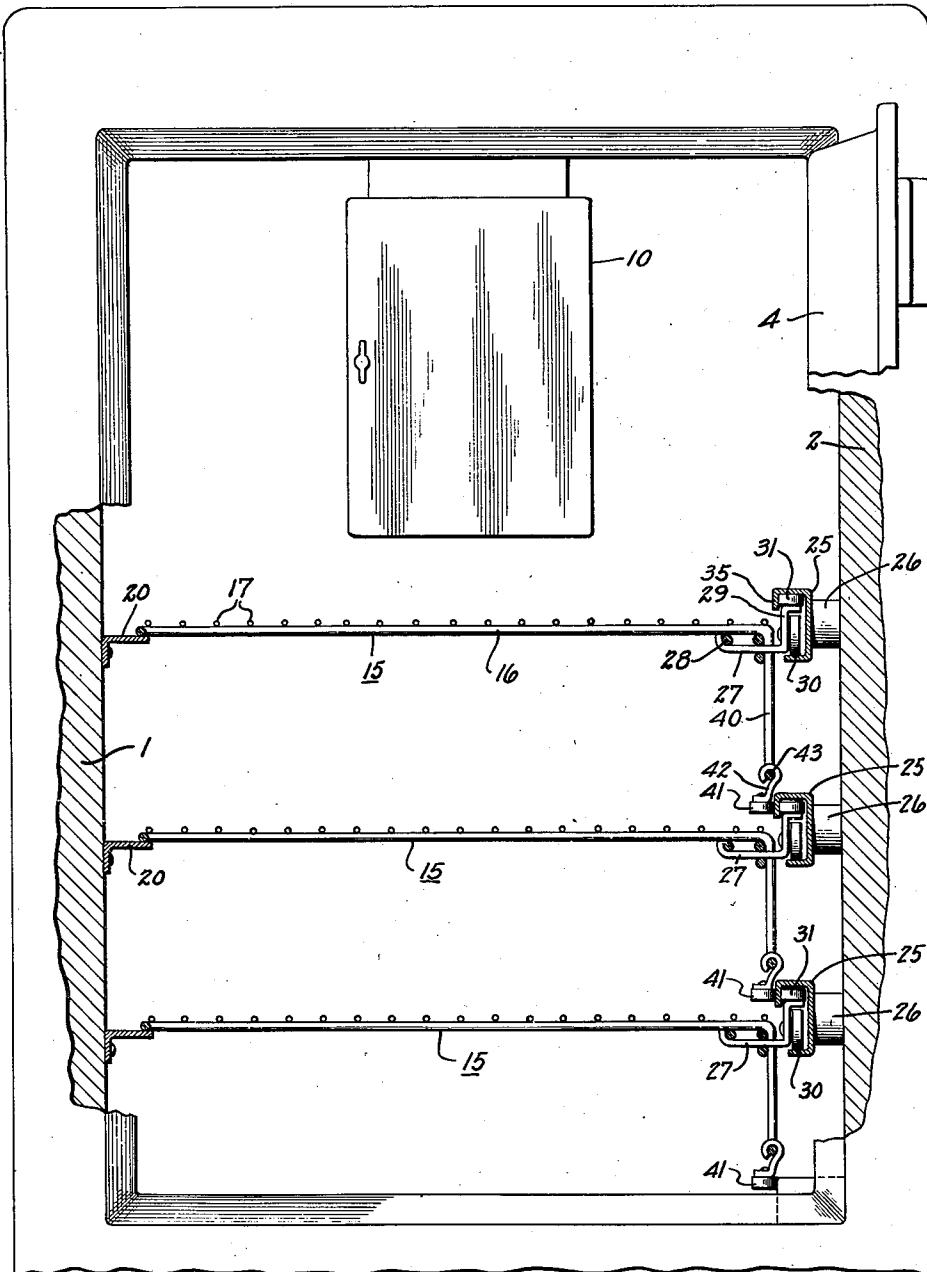


Fig. 2.

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SHELF SUPPORT

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10 Claims. (Cl. 312-186)

The invention relates to new and useful construction for arranging, mounting and supporting shelves, trays, or similar article supports in cabinets or containers such as refrigerators, ovens, closets and the like.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a horizontal section of a refrigerator cabinet embodying the invention; and

Fig. 2 is a front elevation of said cabinet, showing the door open and with certain parts broken away.

An object of the invention is to provide simple, efficient and compact constructions for mounting shelves or the like within a closable cabinet, such as a refrigerator, with means for removing one or more of said shelves from the cabinet for airing and cleaning the interior and for permitting greater access to the interior and to the shelves. The invention is especially directed to employing the door of the cabinet as a means for supporting a shelf or shelves either wholly or in part and also, if desired, as means for moving the shelf or shelves while they are withdrawn from the cabinet. A primary object of the invention is to utilize the door or closure means for such cabinets as an auxiliary shelf support; as a means to which the shelf weight may be transferred either in whole or in part when moved from its normal position within the cabinet; as means for supporting the weight of a shelf either in whole or in part while permitting relative movement of the shelf with respect to the door; and as a means for supporting a shelf for movement in an angular path outside the cabinet. While in the following description and in the drawings the invention is shown and described as preferably applied to a refrigerator cabinet it will be understood that the broad features thereof are also applicable to many other forms of cabinet and

shelf constructions, for example ovens, closets, book cases and the like.

Broadly described the invention comprises mounting shelves in the interior of a cabinet in a known manner so that the shelves are individually slidable horizontally out of the cabinet when the door thereof is open. The inner face of the door is provided with shelf-supporting means onto which a shelf may be moved when it is drawn out of the cabinet and the door is sufficiently open and alined to permit outward movement of the shelf.

The shelf-supporting means on the door are so designed that the shelf may be supported either entirely or partially thereon, depending on whether or not the shelf is entirely withdrawn from the cabinet. When only partially withdrawn the supports on the door lend auxiliary support to that part of the shelf which projects from the cabinet; while when fully withdrawn from the cabinet said supports are adapted to sustain the entire weight of the shelf. In the latter position the door may be swung on its hinges, carrying the shelf away from the open face of the cabinet and thus permitting very full access to the cabinet interior. The shelves themselves are preferably individually movable to and fro, although if desired two or more may be connected to move as a unit. Furthermore, the shelf may extend either entirely or only partially across the cabinet and may be supported from both sides, or only one, when within the cabinet.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the present preferred embodiment of the invention illustrated by way of example in the accompanying drawings, a rectangular cabinet such as is used for a refrigerator is provided with vertical side walls 1 and 2, the rear wall 3, and suitable top and bottom. A door 4 for tightly closing the front face of the cabinet is suitably hinged at the front edge of the side wall 2, being adapted to swing from the closed position (indicated in broken lines in Fig. 1) to a fully open position through an arc of 180° or more. The door is preferably bevelled along its inner edges to conform to similar edges at the ends of the walls of the cabinet and may be provided with closing lips 7 and 8 overlapping the front edges of the cabinet walls. The refrigerator walls and the door are preferably of the usual heavy, sturdy, heat-insulated construction. A refrigerating unit is indicated at 10.

The cabinet is provided with a plurality of horizontal shelves or food trays 15 and in accordance with the invention said shelves are constructed and mounted so as to permit horizontal to-and-fro movement with respect to the cabinet and the door. The shelves may be formed of any suitable material and as shown they are constructed of a strong rectangular framework of steel rods 16 with cross bars 17 of preferably smaller diameter. A reinforcing central bar 18 may also be provided. The shelves are designed to be movably supported from the side wall 2, and if desired, auxiliary supports may be provided by rails 20 which extend from the face of opposite wall 1 and underlie the corresponding edge of the shelf framework 16.

However, the principal support for each shelf will be afforded from the side wall 2 and accordingly a plurality of horizontally extending channel-shaped trackways 25 are fixed to the wall 2 as by a plurality of spaced-apart brackets 26 which may be bolted or otherwise fixed to the inner face of the wall 2. Means are provided for movably supporting the shelves from the trackways 25 and as shown each shelf is hung on a plurality of L-shaped arms or brackets 27, the horizontal legs of which underlie the corresponding lateral frame member 16 of the shelf and extend across for a suitable distance beneath the shelf, which may be reinforced in this area by an additional strengthening frame rod 28, the end of the arm 27 being preferably curved upwardly around rod 28 as shown in Fig. 2. A roller 30 is journaled in the vertically disposed leg 29 of the L-shaped bracket 27, said roller being adapted to travel along the bottom horizontal reach of the channel 25 and to carry the vertical thrust of the shelf weight. A roller 31 is journaled on a vertical axis in the upper horizontal flange of the L-shaped bracket 27 and bears against the vertically disposed lip 35 of the channel 25, thereby to movably support the horizontal thrusts from the weight of the shelf.

Additional means are preferably provided for affording further cantilever support to the right hand edge of the travelling shelf. As embodied, the transverse frame rods 16 and 18 of the shelf may be provided with vertically disposed legs 40 which project downwardly a suitable distance and are provided at their lower ends with horizontally disposed rollers 41 for supporting additional horizontal thrust from the weight of the shelf. As shown, the rollers 41 are rotatably supported by suitable hook-like brackets 42 which may be rigidly suspended from a cross member 43 at the bottom of the vertical members 40. Said rollers 41 bear against and travel along the outer faces of the vertical lips 35 of the channel member 25.

It will be understood that the hereinbefore described mechanism for providing a horizontally movable cantilever support to the shelf from one side wall of the cabinet is merely illustrative of the principles of the invention and that many other and different forms of such support may be designed for the same purpose. Furthermore it will be understood that the shelf 15 may be supported solely by such cantilever means from one side wall only, and that the shelves, or some of them, may not necessarily extend the entire width of the cabinet but may extend only part way across. It is also contemplated optionally to provide relatively narrow and deep, basket-like food containers which may be similarly supported from the wall 2 of the cabinet and mounted between horizontal shelves of the conventional type, which shelves may or may not of themselves

be movable with respect to the cabinet and/or door.

Referring now to the embodied means for transferring a part or all of the weight of a shelf to the door 4, the inner face of the door is provided with trackways or channels 25a at levels corresponding to those within the cabinet along the wall 2. The channels 25a on the inner face of the door are similar in construction to the channels 25 and are suitably aligned vertically and horizontally therewith, the spacer members 26 being provided on the cabinet wall 2 to effect such transverse alinement. Thus when the door is swung open and into the position shown in Fig. 1 it will be possible to move one or more of the shelves 15 out of the body of the cabinet and onto the corresponding trackway 25a on the door. When a partial withdrawal of the shelf is made, the trackway 25a on the door will provide additional auxiliary support to the portion of the shelf projecting out of the cabinet. However, the shelf may be withdrawn entirely from the cabinet as shown in Fig. 1 in which case the entire weight will be supported by the trackway 25a on the door.

After a shelf or shelves have been entirely withdrawn from the cabinet, the door can then be swung beyond the position shown in Fig. 1, thereby moving with it the shelves supported on the trackways 25a. In this manner any one or the entire group of shelves may be removed from the cabinet and swung entirely out of the front opening so as to permit completely free access to the interior of the cabinet. By virtue of the support afforded by the trackways 25a, cooperating with the brackets 27 and 40 on the shelves, the strength of the support is such that articles may be left on the shelves while supported by and swinging with the door.

Ordinarily the matter of alining the trackways 25a with the trackways 25 will be effected substantially automatically in transferring a shelf from the interior of the cabinet to the door and vice versa. If desired, however, any suitable form of temporary stop may be provided for positively fixing and holding the door in alinement with the side wall 2. A suggested form of alining means is indicated in Fig. 1, comprising the spring catch 50 on the outer surface of the wall 2 for engaging and holding the edge of an L-shaped bracket 51 which is slidably mounted on the outer face of the door 4 by suitable bolt and slot connection. A thumb screw 52 is provided for temporarily setting the bracket 51 in alining position.

As a modification, some of the advantages of the invention may be realized by supporting the withdrawn shelf or shelves on supports not necessarily fixed to or a part of the door. That is, shelf-supporting and receiving trackways similar to 25a may be pivotally mounted on the frame of the cabinet adjacent the ends of trackways 25 and adapted to swing horizontally independently of the door itself. When in the closed position, said trackways may be designed to overlie and nest or telescope over the front edges 16 of the shelves, thus being out of the way during normal operation of the cabinet. After the door has been opened one or more of the trackways may be swung horizontally outwardly substantially in the same pathway as the door and into alinement with the corresponding trackway 25, whereupon the shelf may be withdrawn partially or entirely, the withdrawn portion thereof being supported by the pivoted trackway in the same manner as on trackway 25

25a. The pivoted trackways may optionally be limited in their swinging movement to an extended position parallel to and in alinement with the inner trackways 25, or may be swung beyond said position similarly to the door, as may be desired or convenient in practice. If desired, also, connections may be provided whereby the opening and closing of the door will automatically cause said pivoted trackways to follow the movements of the door, although this feature is entirely optional.

The invention in its broader aspects is not limited to the specific mechanism shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. In a cabinet-shelf supporting construction, the combination of a cabinet, a door hinged thereto at one side, a plurality of shelves within the cabinet slidable on and normally supported by supports on a cabinet wall, shelf supports on the door to be alined with said wall supports whereby any shelf may be individually moved from the wall to the door and the door may be swung while carrying the shelf.

2. In a cabinet-shelf supporting construction, the combination of a cabinet, a door hinged thereto at one side, a shelf support on a cabinet wall, a shelf support on the door to be alined with said wall support, a shelf slidable from the wall support to the door support, and means for maintaining the shelf in horizontal position while the door is swung carrying the shelf.

3. In a cabinet-shelf supporting construction, the combination of a cabinet, a door hinged thereto, a plurality of shelves within the cabinet and individually movable to be supported on the door, and members on the door and a cabinet wall to form a cantilever support for the shelf.

4. In a cabinet-shelf supporting construction, the combination of a cabinet, a door hinged thereto at one side, a shelf, supporting means within the cabinet upon which the shelf is slidable, means mounted on said door and shelf for slidably receiving the shelf upon the door and maintaining the shelf in horizontal position and supported on the door.

5. In a cabinet shelf supporting construction, the combination of a cabinet, a shelf support within the cabinet, the shelf being slidable into and out of the cabinet, a member mounted at one side of the cabinet opening and having a trackway movable into horizontal alinement

with the shelf support within the cabinet, connections between said shelf and trackway to permit the shelf to be slid along the trackway, and means at the side of the shelf adjacent the trackway for holding the shelf against vertical movement.

6. In a cabinet shelf supporting construction, the combination of a cabinet, a shelf support within the cabinet, the shelf being slidable into and out of the cabinet, a member mounted at one side of the cabinet opening and having a trackway horizontally swingable into alinement with the shelf support within the cabinet, connections between said shelf and trackway to permit the shelf to be slid along the trackway and means engaging with said trackway member for holding the shelf against vertical movement.

7. In a cabinet-shelf supporting construction, the combination of a cabinet, a door hinged thereto at one side, a shelf, supporting means within the cabinet upon which the shelf is slidable, means on said door for slidably receiving a shelf from within the cabinet, and a cantilever device for maintaining the shelf in horizontal position when entirely supported by said door.

8. In a cabinet-shelf supporting construction, the combination of a cabinet, a door hinged at one side, a shelf, supporting means within the cabinet upon which the shelf is slidable, means on the door for slidably receiving the shelf from the cabinet and supporting the shelf from said door, and means for automatically alining the shelf supports in the cabinet and on the door to permit the shelf to slide from one to the other.

9. In a cabinet-shelf supporting construction, the combination of a cabinet having a front opening, a door hinged at one side and closing the entire opening, shelf supporting means within the cabinet, a shelf support upon the door, a shelf slidable from one of said supports to the other, and means for maintaining the shelf in horizontal position when supported by the door.

10. In a cabinet-shelf supporting construction, the combination of a cabinet having a front opening, a door hinged at one side and closing the entire opening, means within the cabinet for slidably supporting a plurality of shelves, a plurality of shelf supports upon the door, shelves slidable to and fro between the supports in the cabinet and the supports on said door, and means for maintaining the shelves in horizontal position when supported only by said door with the shelves individually accessible at the front and one side.

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