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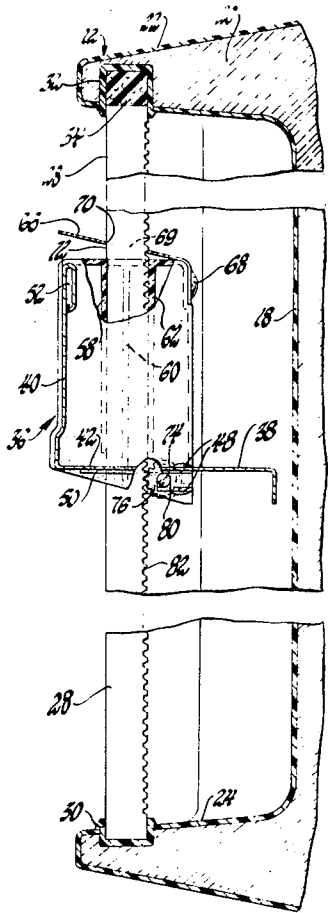
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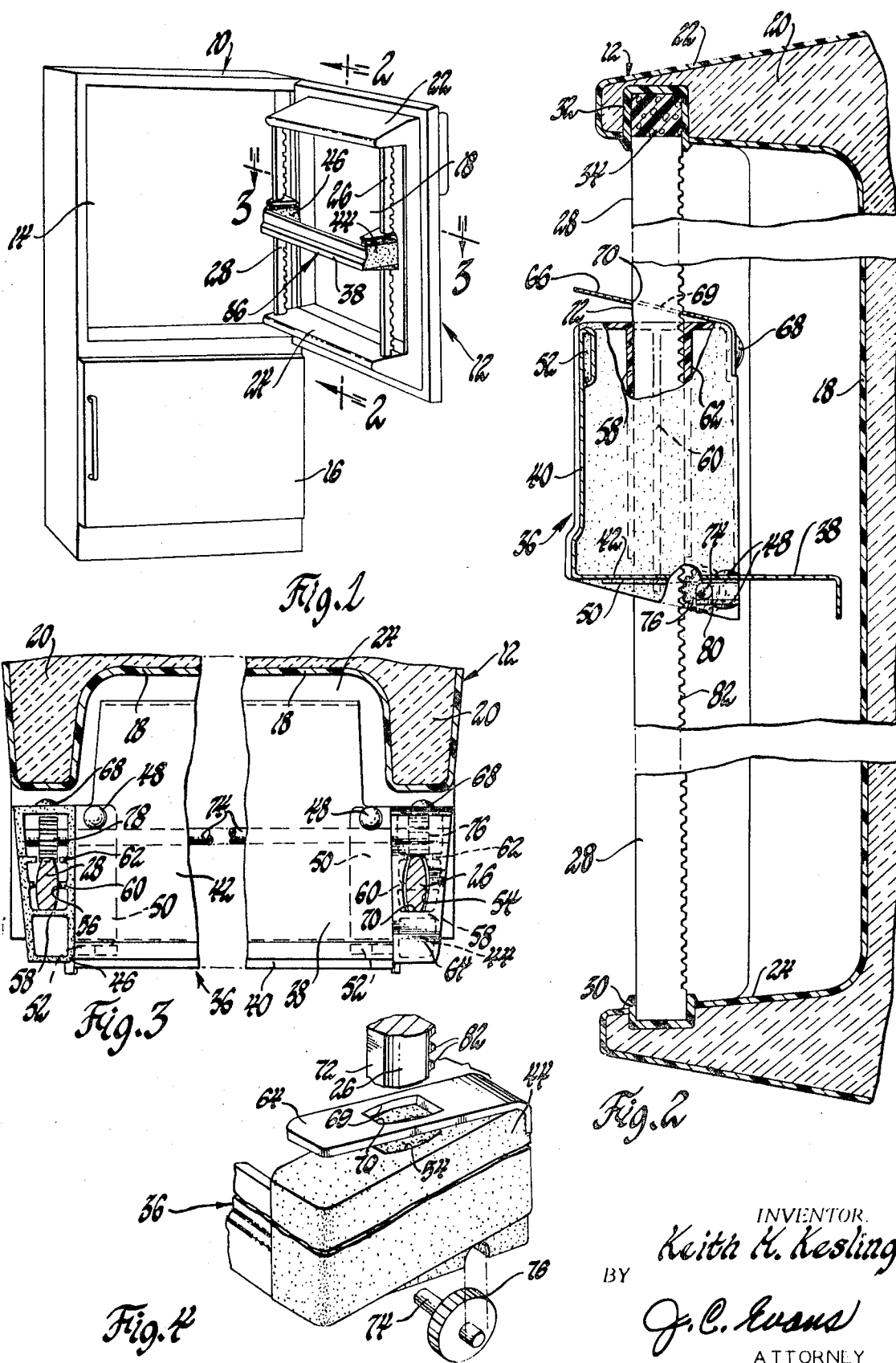
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[54] **INFINITE ADJUSTABLE DOOR SHELF**
1 Claim, 4 Drawing Figs.
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ABSTRACT: In preferred form, a vertically adjustable self-leveling door shelf for a domestic refrigerator having a horizontal surface between end members which move vertically along parallel guide bars. Identical gears fixed to opposite ends of a leveling rod which is supported for rotation by the end members coact with gear teeth on the guide bars to align the shelf horizontally and to prevent binding between the end members and the guide bars. Cantilevered spring steel locks on the end members contact the guide member when in a normal lock position to hold the shelf in a preset vertical location along the guide members. The locks move out of contact with the guide bars when depressed to free the shelf for vertical movement.





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INFINITE ADJUSTABLE DOOR SHELF

This invention relates to an adjustable refrigerator shelf and more particularly to a vertically adjustable door shelf having a self-leveling mechanism.

The large variety of different sized food containers causes problems in prior refrigerators with nonadjustable shelving. Frequent rearranging and shuffling of containers to accommodate odd sizes has long been an aggravating core for the housewife. Usually tall containers such as "jumbo" beverage bottles often do not fit upright between the shelves of prior refrigerators and one opened must be either resealed or left outside the refrigerator.

The vertically adjustable self-leveling door shelf of the present invention provides a convenient shelving for odd size articles and particularly unusually tall containers. The door shelf slides smoothly along vertical guide bars affixed to the inside of the refrigerator door. Gears affixed to opposite ends of a rotational leveling rod mesh with gear teeth on the guide bars to maintain the adjustable door shelf horizontally at all times. Cantilevered spring steel locks attached to the shelf contact the guide bars when in a lock position to hold the shelf in a preset vertical position. Depressing the spring steel locks frees the adjustable shelf to move vertically along the guide bars.

Therefore, an object of the inventor in the present application is to provide a vertically adjustable door shelf including automatic leveling means which maintain the shelf horizontally.

A further object of the inventor in the present invention is to provide a vertically adjustable self-leveling shelf which moves along fixed parallel guide bars and has lock members contacting the guide bars to hold the shelf in a preset vertical position.

A still further object of the inventor in the present invention is to provide a vertically adjustable self-leveling shelf for a domestic refrigerator which moves along fixed parallel guide bars and has identical gears affixed to opposite ends of a rotational horizontal leveling rod which mesh with gear teeth on the guide bars to maintain the shelf horizontally.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

FIG. 1 is a perspective view of a refrigerator with its door in an open position revealing the adjustable door shelf;

FIG. 2 is a vertical view in section taken along section line 2-2 in FIG. 1;

FIG. 3 is a horizontal view in section taken along section line 3-3 in FIG. 1;

FIG. 4 is an exploded view of the adjustable door shelf.

In FIG. 1 of the drawings, a refrigerator 10 is illustrated. A door 12 to the upper food compartment 14 of the refrigerator is shown in an open position. A door 16 to the lower freezer compartment of the refrigerator is shown in a closed position. The door 12 includes an outer sheet metal panel and an inner molded plastic panel 18 joined together at peripheral edges. Molded in place plastic insulation 20 is between the outer surface of door 12 and inner panel 18. Molded panel 18 has rearwardly projecting top and bottom ledges 22 and 24 respectively. Parallel guide bars 26 and 28 are vertically supported by ledges 22 and 24. The lower ends of the guide bars 26 and 28 are held by cup-shaped retainers in ledge 24 as is best seen in FIG. 2. The top ends of the guide bars 26 and 28 are supported by cup-shaped retainers 32 in ledge 22. Resilient rubber inserts 34 within retainers 32 axially position guide bars 26 and 28. The guide bars are inserted in panel 18 by compressing the

rubber insert 34 by the bar's top end and fitting the bar's lower end within retainer 30.

An adjustable shelf assembly 36 is supported on the guide bars 26 and 28. Shelf assembly 36 includes a middle member 38 of aluminum. Member 38 has a front vertical surface 40 and a horizontal surface 42 for supporting articles within the refrigerator. End members 44 and 46 are connected to opposite ends of the middle member 38. Rivets 48 attach horizontal surface 42 of the member 38 to flanges 50 on the end members. The top of the vertical surface 40 is rolled over tabs 52 on the end members.

End members 44 and 46 slide vertically along the parallel guide bars 26 and 28. The guide bars extend through vertical holes 54 and 56 formed in end members 44 and 46 respectively. In the preferred form shown in the drawings, end members 44 and 46 are hollow molded plastic pieces as best shown in FIG. 3. The holes 54 and 56 are formed in end pieces 44 and 46 but internal ribs 58, 60 and 62.

Cantilevered spring steel locks 64 and 66 are attached to the end members 44 and 46 respectively to hold the shelf 36 in a preset vertical position. The ends of locks 64 and 66 are attached to end members 44 and 46 by rivets 68. The locks 64 and 66 have cutouts 69 through which the guide members 26 and 28 extend. Edges 70 of the cutouts 69 contact the front faces 72 of the guide bar when the locks are in a lock position as shown in FIG. 2. To release the shelf 36 for vertical movement along the guide bars, the outwardly projecting ends of the locks are depressed to move edges 70 away from faces 72.

The shelf 36 includes a self-leveling mechanism which maintains the surface 42 of the shelf horizontal and prevents binding between the end members, 44, 46 and the guide bars 26, 28. A leveling rod 74 is supported for rotation by end members 44 and 46. Identical gears 76 and 78 are fixedly attached to opposite ends of the leveling rod 74 for rotation together. Rod 74 is supported at its ends by retainer plates 80 which are fastened to end members 44 and 46 by rivet 48. The gears 76 and 78 mesh with gear teeth 82 on the back face of guide bars 26 and 28. When the shelf 36 is moved vertically, the gear teeth 82 cause gears 76 and 78 to rotate leveling rod 74. Because the gears 76 and 78 are fixedly secured to the leveling rod 74, unequal vertical movement of end members 44 and 46 is not possible.

While the embodiment of the present invention as herein described constitutes a preferred form, it is to be understood that other forms may be adapted.

What is claimed is as follows:

1. A vertically adjustable self-leveling shelf for a domestic refrigerator comprising: means forming a shelf including a horizontal surface for supporting objects; members connected to ends of said horizontal surface each having a vertical hole therethrough; guide bars vertically supported in parallelism by the refrigerator; said guide bars and said holes in said end members coacting to control movement of said shelf means in a vertical direction; gear teeth on said guide bars; a rotatable level or rod horizontally supported between said end members; identical gears fixedly secured to opposite ends of said leveling rod and rotatable therewith; said gears meshing with said gear teeth to rotate said leveling rod as said shelf means is moved vertically along said guide bars; a cantilevered spring steel member attached at one end to said end member and contacting said guide bar when in a lock position to hold said shelf means in a preset vertical position; said spring steel member pivotal into an unlock position not contacting said guide bar and whereby said horizontal surface of said shelf means is maintained horizontal when the shelf means is vertically moved by coaction between said leveling rod said gears and said gear teeth.