July 16, 1935. E. L. BETTS 2,008,091

SLIDING SHELF

Filed Dec. 16, 1931

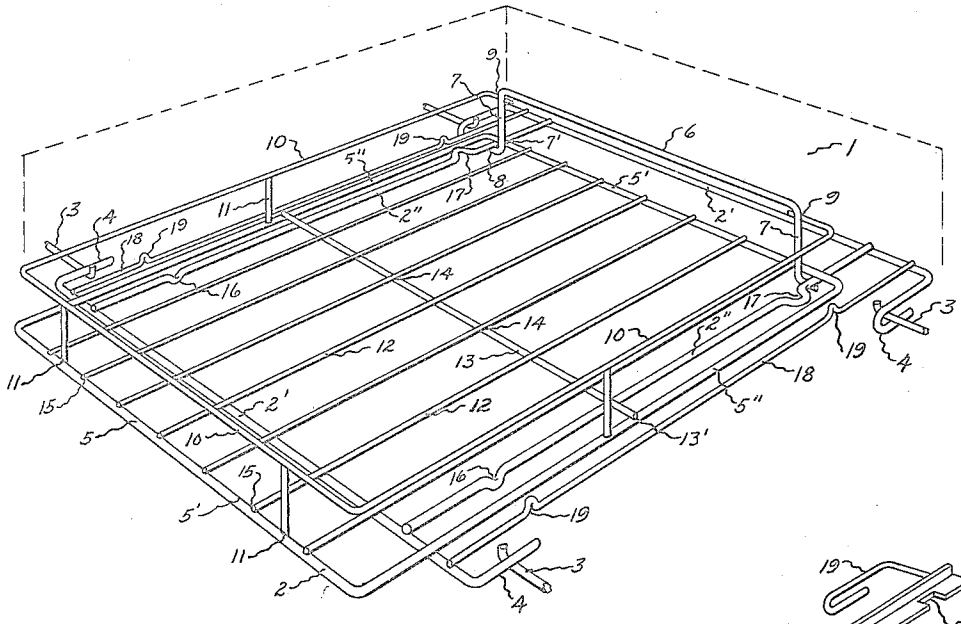


Fig. 1

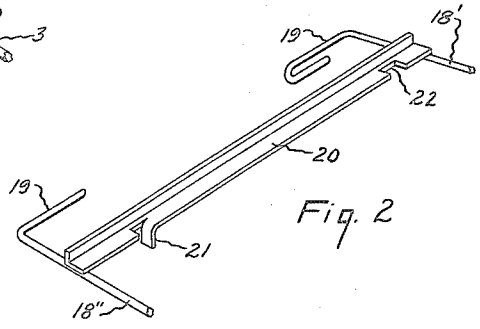


Fig. 2

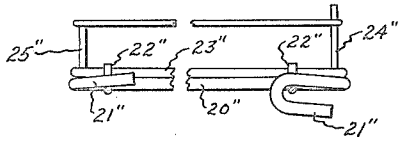


Fig. 4

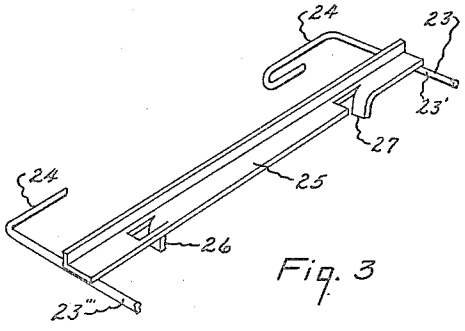


Fig. 3

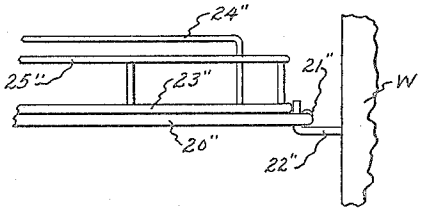


Fig. 5

Inventor

Earl L. Betts

By Joseph P. Beaman

Attorney

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SLIDING SHELF

Earl L. Betts, Battle Creek, Mich., assignor to United Steel and Wire Co., Battle Creek, Mich., a corporation of Michigan

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12 Claims. (Cl. 211—143)

This invention relates to improvements in sliding safety shelves or racks of the removable type.

Altho it is obvious that the shelf or rack described in the following specification is adapted to be used in any type of receptacle in which a sliding shelf would be advantageous, this invention has particular application in shelves for refrigerators.

One of the objects of this invention is to provide a guiding and supporting frame work for a sliding shelf which can be supported in the receptacle by simple means and which can at the same time be readily removed and re-positioned for cleaining and adjustment.

Another object of this invention is to provide a sliding shelf or rack which when drawn out to its outermost position is non-tiltable and cannot be accidently detached from its guiding and supporting means while in a drawn out position.

A further object of this invention is to provide a sliding safety shelf or rack which can only be removed from its guiding and supporting means when the shelf is in substantially its innermost position and can in that position, be bodily lifted vertically keeping the shelf and its contents always in a horizontal plane.

With these and other objects which will appear as the description proceeds, this invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawing wherein several convenient embodiments of the invention are set forth,

Fig. 1 is a perspective view of a rack or shelf slidably carried upon a frame work which is removably supported in a receptacle, only fragments of the walls of the receptacle being illustrated.

Fig. 2 is a partial perspective view of a modified frame work which is adapted to support and guide the sliding shelf or rack shown in Fig. 1.

Fig. 3 is a partial perspective view of still another modified frame work which is likewise adapted to support and guide the sliding shelf or rack shown in Fig. 1.

Fig. 4 is a partial side elevation of a modified means of guiding the shelf shown in Fig. 1.

Fig. 5 is a partial front elevation of Fig. 4.

In Fig. 1 reference character 1 designates the fragments of the back and side walls of a receptacle, for example, the walls of a refrigerator or the like. Supported within the walls 1 upon some suitable supporting means 3 such as brackets, screws, nails, pins or the like is a frame work generally designated 2 and consisting of front and rear wire members 2′ bent inwardly to form supporting arms 4, which rest upon the supporting means 3, and side wire members 2″ secured to the members 2′ by spot-welding.

Adapted to be slidably supported upon the frame work 2, a shelf or rack generally designated 5 is provided consisting of front and rear wire members 5′ and side wire members 5″. A horizontal rear rail 6 provided with vertical legs 7 and terminating in short horizontal feet 8 is secured to the rear wire member 5′ by spot-welding at 7′. Secured to the rear railing 6 by spot-welding at 9 is a side and front railing 10 which is supported from the side members 5″ and front member 5′ by posts 11.

To provide a bottom for the sliding shelf or rack, rectangular wires 12 are supported by a central supporting and stiffening wire member 13 secured at 13′ to the side members 5″ by spot-welding and are held in position by spot-welding at 15 on the front and rear members 5′ and at 14 to the central supporting and stiffening wire member 13.

Altho circular wire stock has been employed throughout with the exception of the rectangular bottom wires for the construction of the frame work and shelf and it has been secured together by spot-welding, it is obvious that other material and uniting means may be employed within the spirit of this invention.

The means for permitting the shelf 5 to slide upon the frame work 2 without danger of accidental tilting, when the shelf 5 and/or its contents becomes over balanced upon the front member 2′ of the frame work 2 when the shelf or rack 5 is drawn forward to conveniently remove its contents, consist in the sliding and guiding cooperation of the legs 7 and feet 8 with the side members 2″ of the frame work.

As depicted in Fig. 1, the feet 8 extend under the members 2″ to an extent equal to substantially the width of members 2″. When the shelf is slid forward the legs 7 and feet 8 are in substantial sliding contact with the inner side and bottom of the members 2″, respectively. To limit the forward sliding of the shelf the members 2″ are permanently deflected downward in a vertical plane to provide stops 16 with which the feet 8 contact.

To provide a sliding shelf which is non-tiltable when in the forward position and yet can be removed from the supporting frame work without tilting the shelf and its contents or running the

risk of having the shelf accidentally fall free from the frame work during the initial movement of the removing operation, the members 2'' are permanently deflected in a horizontal plane at 17 sufficiently to permit the feet 8 when positioned directly beneath the deflected portion to clear the members 2'' when the shelf is lifted vertically. It is only at this limited point of the sliding path of the feet 8 that the shelf 5 is unlocked from the frame work 2. It is thus impossible for the shelf to be accidentally removed or overbalanced in an unsupported forward position as it is possible with that type of sliding shelf which is removed at the forward position by slightly tilting the shelf in order to permit a projection upon the shelf to become inoperative and pass a stop upon the supporting frame work.

In Fig. 2 is shown a modified supporting frame work which is adapted to guide and support the shelf or rack shown in Fig. 1. In this embodiment, the frame work consists of front and rear wire members 18'' and 18' bent inwardly to provide supporting arms 19'. Secured to the members 18' and 18'' by spot-welding is an angle iron 20 constituting the guiding and locking means for the legs 7 and feet 8.

To limit the forward movement of the shelf or rack, an L-shaped cut is made in the angle iron 20 and that portion defined by the cut depressed to form a downwardly extending vertical stop corresponding to the stop 16 of Fig. 1. Likewise to permit the shelf or rack 2 to be removed from the supporting frame 18, a portion of the angle iron is removed as at 22 to provide a passage-way for the feet 8 when the shelf is vertically removed.

In Fig. 3 is shown another modified supporting frame adapted to guide and support the shelf or rack shown in Fig. 1. In this embodiment the frame work is generally designated 23 and consists of front and rear wire members 23''' and 23' bent inwardly to provide supporting arms 24. Secured to the members 23''' and 23' by spot-welding is an angle iron 25 constituting guiding and locking means for the legs 7 and feet 8.

To limit the forward movement of the shelf or rack 5, a U-shaped cut is punched in the angle iron 25 to provide a vertical stop 26. To facilitate the removal of the shelf or rack 5 from the locking and guiding angle iron 25 when the shelf is in a substantially innermost position, and to insure the locking of the shelf to the frame work during a forward withdrawing operation, an inclined releasing surface 27 is provided on the angle iron 25 by making an L-shaped cut in the inner edge thereof and bending that portion of the angle iron defined by said cut to form a surface inclined to the plane of the angle iron 25.

The operation of the shelf or rack 5 in the frame work shown in Fig. 3 is as follows: the side wire members 5'' are supported on the horizontal portion of the angle iron 25 and are guided by the vertical walls of said angle iron. The feet 8 are located below the horizontal portion of the angle iron 25 and lock the shelf 5 to the frame work 23. When the shelf is in its innermost position the feet 8 are to the rear of the inclined surface 27 and extend below the bottom of the horizontal portion of the angle iron 25 an amount sufficient to clear the surface 27 as the slide is drawn forward to contact with the stop 26. If the removal of the shelf 5 from the frame work 23 is desired, the operator, when the feet 8 of the shelf 5 are forward of the surface 27, tilts the shelf 5 slightly upon the forward end edges of the angle iron 25 and forces the shelf 5 rearwardly causing the feet 8 to ride up the inclined surface 27 and rest upon the top surface of the horizontal portion of the angle iron 25; the shelf 5 in this position being unlocked from the frame work and adapted to be removed. If the operator does not desire to remove the shelf 5 after it has been drawn out to a forward position, it is only necessary to force the shelf 5 rearwardly without tilting as the feet 8 pass below the surface 27. In case the shelf is inadvertently left upon the frame work 23 in an unlocked condition, as the shelf 5 is drawn forward supposedly locked, the feet 8 will ride down the surface 27 due to the weight of the shelf 5 and/or its contents and automatically lock the shelf 5 to the frame work 23 and thus avoid accidental tilting of the shelf.

With the type of frame work shown in Fig. 1, it is necessary to provide guiding means for the side members 5'' for the shelf 5. One convenient guide means consists in wire members 18 having guiding projections 19 secured to the members 2' and spaced in the frame a distance slightly greater than the width of the shelf 5.

In order to reduce the cost of the frame work 2 shown in Fig. 1, it is possible to omit the guiding members 18 from the frame work 2 and utilize the supporting means for the inwardly turned supporting arms 4 as guiding means for the shelf. The means for effecting this economy is shown in Fig. 4 and Fig. 5 wherein a frame work 20'' similar to frame work 2 is slightly modified by bending the support arms 21'' upward to reduce the length of the needed vertical projection of the bracket screws or bolts 22'' required to project into the horizontal plane of the side members 23'' of the shelf. The bracket screws or bolts 22'' are detachably secured in the walls W of the receptacle and comprises an L-shaped structure as shown in Fig. 5, the vertical projection thereof being sufficient to form guiding projections for the side members 23'' of the shelf. The shelf shown in Fig. 4 and Fig. 5 may be identical with the shelf 5 of Fig. 1; the members 24'' and 25'' corresponding with elements 6 and 10, respectively.

To those skilled in the art it will be obvious from the foregoing description, that a supporting frame and sliding shelf has been provided which can be readily inserted and supported in a receptacle without special securing means; that the supporting frame work for the sliding shelf is adapted to be as readily removed as the sliding shelf itself; and that the risk of the sliding shelf being accidently tilted from its supporting frame work is entirely removed.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

I claim:

1. In a receptacle of the class described, a slidable shelf provided with a retaining railing vertically spaced from said shelf, a supporting frame-work for said shelf, guiding and locking means in said frame-work, and means including an integral continuation of said railing of said shelf cooperating with said first mentioned means to unremovably lock said shelf to said frame-work in a drawn out position.

2. In a receptacle of the class described, a slidable shelf provided with a retaining railing vertically spaced from said shelf, a supporting

frame-work for said shelf upon which the entire area of said shelf is superimposed, guiding and locking means in said frame-work, and means including an integral continuation of said railing of said shelf cooperating with said first mentioned means to unremovably lock said shelf to said frame-work in a drawn out position.

3. In a receptacle of the class described, the combination of a slidable shelf, a supporting frame for said shelf, means secured in said receptacle to support said frame work, a guiding and locking member secured in said frame-work, said member being permanently deflected in limited areas inwardly from the ends thereof to provide stopping and releasing means for said shelf, means constituting a part of said shelf cooperating with said guiding means to unremovably lock said shelf to said frame-work in a drawn out position and to release said shelf to a vertical component movement when in a substantially innermost position, said first mentioned means projecting into the horizontal plane of said shelf to provide guiding projections engageable with the sides of said shelf whereby said shelf is additionally guided on said frame-work.

4. In a receptacle of the class described, a slidable shelf, having a retaining railing vertically spaced from said shelf, a supporting frame for said shelf, guiding and locking means in said frame-work, said means consisting of substantially parallel members secured in said frame-work, said members being permanently deflected in limited areas inwardly from the ends thereof to provide stopping and releasing means for said shelf, means including an integral continuation of said railing of said shelf cooperating with said guiding means to unremovably lock said shelf to said frame-work in a drawn out position and to release said shelf in a substantially innermost position.

5. In a receptacle of the class described, the combination of a slidable shelf, a supporting frame-work for said shelf including members having supporting arms, supporting bracket means consisting of guiding and supporting portions secured in said receptacle upon which are supported said arms, said guiding portions of said means projecting into the horizontal plane of said shelf adjacent the edges thereof for slidably guiding said shelf upon said frame-work.

6. In a receptacle of the class described, the combination of a slidable shelf, a supporting frame-work for said shelf including members having supporting arms forming an acute angle with the plane of said members, supporting bracket means consisting of guiding and supporting portions secured in said receptacle upon which are supported said arms, said guiding portions of said means projecting into the horizontal plane of said shelf adjacent the edges thereof for slidably guiding said shelf upon said frame-work.

7. In a receptacle of the type described, the combination of a slidable shelf, a supporting frame for said shelf, supporting means for said frame, a back bar in said frame, forwardly extending, rearwardly opening U-loops integrally formed on the ends of said bar and receiving certain of said supporting means, guiding and locking members secured in said frame, said members being permanently deflected in limited areas inwardly from the ends thereof to provide stopping and releasing means for said shelf, means constituting a part of said shelf cooperating with said guiding means to unremovably lock said shelf to said frame in a drawn out position and to release said shelf to a vertical component movement when in a substantially innermost position, said first means projecting into the horizontal plane of said shelf to provide guiding projections engageable with the sides of said shelf whereby the same is guided on said frame.

8. In a receptacle of the type described, a slidable shelf having a retaining railing, vertically spaced from said shelf, a supporting frame for said shelf, supporting means for said frame, a back bar in said frame, forwardly extending, rearwardly opening U-loops, integrally formed in the ends of said bar and receiving certain of said supporting means, guiding and locking means in said frame, said last means comprising substantially parallel members secured in said frame, said members being permanently deflected in limited areas inwardly from the ends thereof to provide stopping and releasing means for said shelf, means including an integral continuation of said railing of said shelf cooperating with said guiding means to unremovably lock said shelf to said frame in a drawn out position and to release said shelf in a substantially innermost position, and additional means on said frame, engageable with the sides of said shelf for guiding the same on said frame.

9. In a receptacle of the class described, the combination of a slidable shelf, a supporting frame for said shelf comprising side members having supporting arms, supporting brackets secured in said receptacle and forwardly extending, rearwardly opening U-loops integrally formed in the ends of certain of said arms and receiving certain of said brackets, said brackets projecting into the horizontal plane of said shelf engageable with the sides of said shelf whereby the same is slidably guided by said brackets upon said frame.

10. In a receptacle of the class described, the combination of a slidable shelf, a supporting frame for said shelf including members having supporting arms, supporting brackets comprising guiding and supporting portions, and forwardly extending, rearwardly opening U-loops integrally formed on the ends of certain of said arms and receiving certain of the supporting portions of said brackets, said guiding portions of said brackets extending into the horizontal plane of said shelf engageable with the sides of said shelf whereby the same is slidably guided by said guiding portions upon said frame.

11. In a receptacle of the class described, the combination of a forwardly slidable shelf, a generally rectangular supporting frame for said shelf having supporting arms located at the corners thereof, supporting brackets secured in said receptacle presenting horizontally disposed portions upon which said arms are freely supported, the arms located in the rear corners of said frame being constituted as rearwardly opening U-loops within which certain of said brackets are received, portions of said U-loops underhooking said brackets with said frame in position to prevent tilting of the same upon forward sliding movement of said shelf, said U-loop arms enabling said frame to be removed by forward movement.

12. In a receptacle of the class described, the combination of a forwardly slidable shelf, a generally rectangular supporting frame for said shelf having front and rear bars, rearwardly extending substantially horizontally disposed arms located at opposite sides of said frame and integrally formed with said front bar, rearwardly opening

U-loop shaped arms located at opposite sides of said frame and integrally formed with said rear bar, certain portions of said last arms being located in substantially the same horizontal plane as said first arms, other portions of said last arms being offset from said horizontal plane, supporting brackets secured in said receptacle presenting horizontal portions upon which said arms are freely supported, said offset portion of said last arms underhooking said brackets with said frame in position to prevent tilting of the same upon sliding movement of said shelf, said U-loop shaped arms enabling said frame to be removed by forward movement.

EARL L. BETTS.