Aug. 12, 1958 T. F. BIERE 2,847,266

SLIDING DOOR SUPPORT AND GUIDE MEANS

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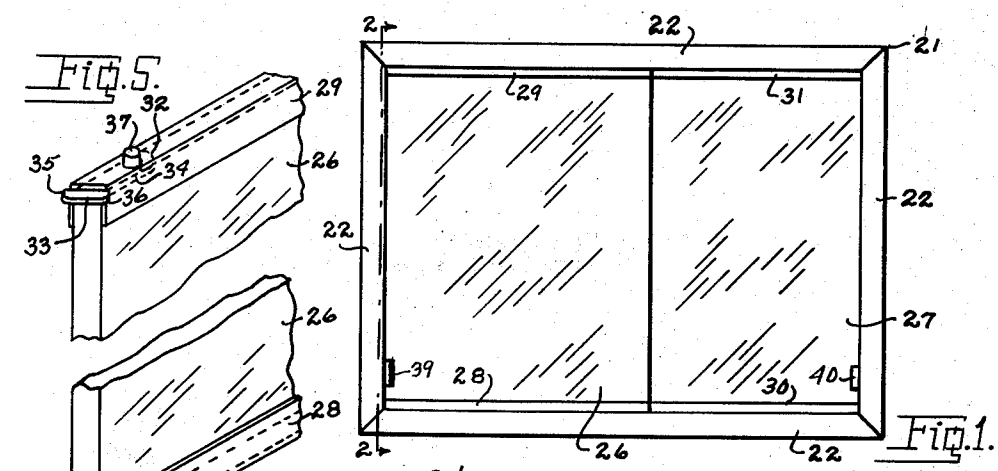


Fig. 1.

Fig. 5.

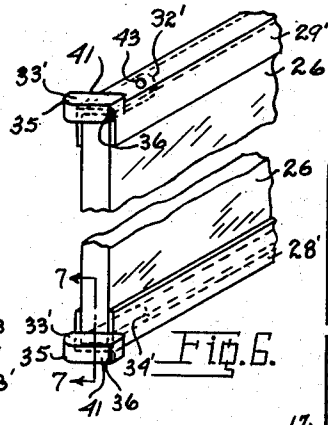


Fig. 6.

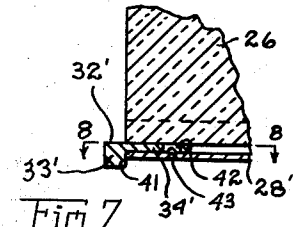


Fig. 7.

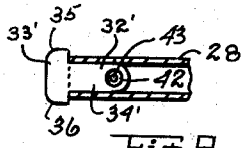


Fig. 8.

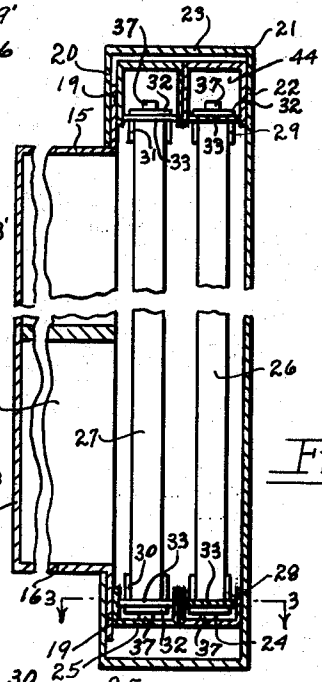


Fig. 2.

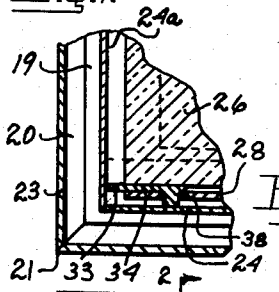


Fig. 4.

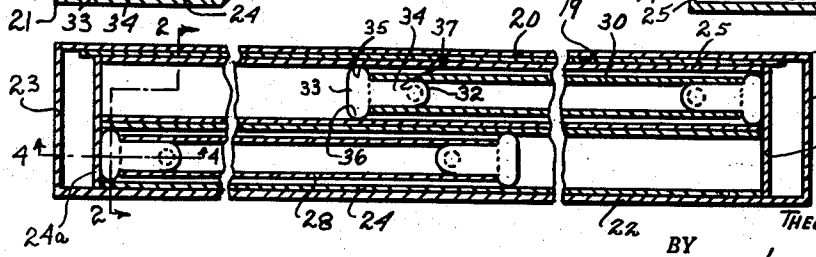


Fig. 3.

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SLIDING DOOR SUPPORT AND GUIDE MEANS

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8 Claims. (Cl. 312—227)

This invention relates to improvements in guide and slide means for sliding doors and has particular reference to such means for use with the sliding doors of household cabinets such as are commonly found in bathrooms.

Bathroom cabinets are equipped with glass mirrors which constitute or form the doors thereof. It is customary to frame the said doors in metallic frames which are disposed in suitable guides at the forward end of the cabinet. The mounting of the said framed mirror doors is generally in a metal trackway which, of course, results in a metal to metal contact during the sliding of the door to a closed and an opened position with, frequently, annoyances developing due to the squeaks and other noises caused by said metal to metal contact. Various attempts have been made to avoid this condition and while some success has been achieved in so far as a part of this contact is concerned there is still considerable metal on metal sliding with its resultant annoyances.

By the present invention all metal to metal contact has been avoided and a completely silent and efficient operation of the parts a result.

It is, therefore, the principal objects of the present invention to provide means for mounting a sliding door in a metal guiding track or trackway and in which the door is maintained free of any contact with said trackway.

Another object of this invention is the provision of a simple non-metallic support and guide for sliding doors for supporting and guiding the door relative to a guiding trackway.

A further object of the present invention is the provision of a combined sliding support, guide and bumper for the corners of a bathroom cabinet sliding door for permitting substantially friction-free and noiseless movement of the door and non-contact of the door and trackway during its movement.

Other objects and advantages of the present invention should be readily apparent by reference to the following specification considered in conjunction with the accompanying drawings forming a part thereof and it is to be understood that any modifications may be made in the exact structural details there shown and described, within the scope of the appended claims, without departing from or exceeding the spirit of the invention.

In the drawings:

Fig. 1 is a front elevation of a bathroom cabinet having embodied therein the improvements of the present invention.

Fig. 2 is an enlarged fragmentary vertical sectional view through the cabinet of Fig. 1 as seen from line 2—2 thereon, Fig. 2 being preferably staggered as seen from line 2—2 on Fig. 3.

Fig. 3 is an enlarged fragmentary sectional view through the device as seen from line 3—3 on Fig. 2.

Fig. 4 is a fragmentary vertical sectional view through a corner of a sliding door and its trackway as seen from line 4—4 on Fig. 3.

Fig. 5 is a fragmentary perspective view of a door embodying the principles and mechanism of the present invention.

Fig. 6 is a fragmentary perspective view, similar to Fig. 5, of a door disclosing a modification of the specific means or mechanism forming the subject matter of this invention.

Fig. 7 is a fragmentary vertical sectional view of a corner of the modified structure of Fig. 6 as seen from line 7—7 on said Fig. 6.

Fig. 8 is a horizontal sectional view showing the modified guide, slide and bumper of the present invention and as seen from line 8—8 on Fig. 7.

Throughout the several views of the drawings similar reference characters are employed to denote the same or similar parts.

As is well known, bathroom cabinets, sometimes referred to as medicine cabinets, are generally mounted within the wall of the room with a suitable frame projecting into the room from the wall. All such cabinets are generally provided with a glass mirror as a door and the larger, or double capacity cabinets, are provided with sliding doors whereby either side of the cabinet may be fully opened or each side partially opened. Such a double capacity cabinet is fragmentarily illustrated in the drawings.

Specifically, the cabinet is generally rectangular in area and has walls such as the top 15 and bottom 16 joined by ends 17, only one of which is shown, and with all such walls terminating in a back wall 18. The forward end of such a cabinet is normally open and has secured to it in any suitable or desirable manner the frame which projects into the bathroom and forms the means for supporting the door or doors.

One method of attaching the frame to the cabinet, per se, as illustrated in the drawings, may comprise forming outwardly or radially projecting flanges 19 on the top, bottom and end walls of the cabinet for attachment to the rear flange 20 of a frame indicated in its entirety by the numeral 21.

As illustrated in the drawings the frame 21 is substantially channel-shaped and therefore, comprises a front flange 22 opposed to the back flange 20 and joined to one another by a base 23. It should be noted that the front flange 22 and/or the base 23 may be contoured, fluted or the like, not shown in the drawings, for the purpose of strengthening or decorating these parts for enhancing the beauty of the said frame. In any instance the said frame has disposed interiorly thereof the guide channels or trackway for the doors. It should be further noted that the said frame 21 is made up of horizontal and vertical members, each being a length of section of channel which has its ends suitably connected, generally by mitering the same and welding, soldering or otherwise securing the said mitered ends in end or butt engagement.

Disposed interiorly of each of the frame horizontal and vertical members are the guide tracks or trackways 24 and 25 for the doors 26 and 27; the guide track or trackway 24 being illustrated for the left-hand door in Fig. 1 while the guide track or trackway 25 is for the right-hand door. It is to be understood that the said guide tracks or trackways 24 and 25 are made up of horizontal sections of U-shaped channel and respectively disposed in the similar sections of the frame 21. The door frame sides may be formed from side plates 24*a* and 25*a* carried by the side portions of the frame 21.

The doors 26 and 27 are sheets of plate glass with the rear surface suitably processed or silvered to form same into mirrors and the said doors may be framed on each of their four sides by a reinforcing member or U-shaped channel, but in any event, the said doors 26 and 27 are provided along their lower and upper sides with a framing channel and which channels for the door 26

are respectively indicated by reference numerals 28 and 29 while the similar channels for the door 27 are indicated by the reference numerals 30 and 31.

In the past the door channels or frame members have been made to such a dimension as to relatively, freely slide in the guide channels 24 and 25 wherefor the door channels sides rubbed against or contacted the guide track channels sides with the result that a sliding irritating noise resulted each time the door was opened or closed. Also, the base of the door frame channels slid or rode on the base of the guide tracks with the resulting annoying noise. Furthermore, the continual sliding of these metals on one another resulted in a galling thereof which not only increased the annoying noise but resulted in a high degree of friction between the parts so that the said doors were difficult of opening and closing.

Several attempts were made to relieve this situation such as by forming the trackway channels of a synthetic plastic and also by providing a non-metallic supporting surface on the inner surface of a metallic trackway, but these attempts only partly relieved the objections to the basic structure since the side flanges of the door frame and the trackway channel would still rub or the materials were non-compatible causing friction to interfere with the sliding of the doors.

In order to overcome the difficulties of all prior known structures there is disclosed herein the use of a non-metallic guide, sliding member and bumper located at each corner of each door. The said member is indicated in the drawings by the reference numeral 32 and the preferred construction, illustrated in Figs. 2, 3, 4 and 5, comprises a member that is substantially T-shaped in plan and including a transverse arm 33 from one side of which projects a stem 34. The arm 33 has its ends rounded, as at 35 and 36, and is of a length to snugly fit and slide within its guide channel 24 or 25. The said member 32 is, by comparison with its length and width, relatively thin and is provided just inwardly of the free end of its stem with a downwardly projecting circular boss 37. The boss 37 is adapted to be projected through an aperture 38 formed in the base of the door framing channel. Each of the door framing channels 28—31 has an aperture 38 formed therein, from each end thereof, at a point which positions the transverse arm 33 to have its inner surface snugly abutted against the end of the channel. The fit of the lug 27 with the channel aperture 38 is such that the member 32 is thereby secured in position.

It should be noted that, in practice, the guiding channels or trackways 24 and 25 are preferably made of stainless steel so as to withstand the dampness and other conditions generally encountered in bathrooms and that the mirror door framing channels 28—31 are likewise formed of stainless steel.

A door is assembled by first attaching to each end of each door framing channel a non-metallic guide, sliding and bumper member 32 whereupon the said door framing channels are secured to the upper and lower sides of the door. This results in the said member 32 having its arm 33 projecting outwardly ahead of each corner of the door, as illustrated for one end of a door in Fig. 5. At the same time the lug 37 of each member 32 outwardly projects from its door framing channel so as to project, particularly, therebelow. The doors are then respectively mounted in their guiding channels and each door is supported on the lugs 37 projecting from its lower channel, such as door framing channels 28 and 30 in Fig. 2, onto the base of the said guiding channels 24 and 25 and with the arms rounded ends 35 and 36 in contact with the inner surface of the channel sides for eliminating any free movement between the door and its guiding channel. The said members 32 project ahead of the upper door framing channels 29 and 31 and likewise guide the upper ends of the doors in the upper guiding channels.

It should be noted that the doors 26 and 27 are respectively mounted in the guide channels or trackways 24 and 25 by inserting the upper ends thereof into the upper course of its guide channel or trackway and the said door raised into the space 44, normally above each door, until the lower end of the door can be swung into the lower course of its trackway whereupon the door is lowered into said lower course until lugs 37 of the member 33 supports the door.

In order to fully open a compartment of the medicine cabinet the doors must be actuated to a fully open position which would be against the opposite frame side and in the past it was necessary to provide the said frame side, preferably the guide channel therein, with a bumper to prevent nicking or other damage to the door end. By the present invention, and as clearly illustrated in Fig. 4, the free end of the member arm 33 acts as a bumper to engage the base of the guide channel in the said ends of the frame.

Any suitable or desirable means may be employed through which the doors are actuated such as handles 39 and 40, respectively, for door 26 and door 27.

The members 32 are, as indicated above, formed or molded from non-metallic material and preferably from a material which has high sliding qualities such as "nylon," although the member may be made of some other specific material and may even be cut or formed from solid material such as fiber and the like. It is merely a necessary quality of the material from which the member 32 is formed that the same be compatible with the guideway track material as to be silent upon sliding thereon and that the said material be sufficiently resilient to absorb the shock should a door be too violently closed or opened.

The member 32 may take any suitable or desirable form so long as it provides a sufficient surface for supporting the door during the movement thereof and that it guide the door when being opened and closed. These qualities are fulfilled in the form of the member illustrated in Figs. 6, 7 and 8 and wherein the guiding of the door is effected through the arm 33' of the member 32' but which member, instead of having a projecting lug 37 at its inner end, has its outer end, or arm 33', thickened to provide in effect a downwardly projecting lug as at 41, see Fig. 7, for supporting and guiding the door while it is being moved. The member 32' is provided just inwardly of the inner end of its stem 34' with an aperture 42 and which aperture is adapted to receive an inwardly projecting lug or "dimple" 43 from the base of the door framing channel and through which the said modified member 32' is secured in position.

It will be noted that the modified member 32' of Figs. 6, 7 and 8 has all of the elements and functions of the preferred form in Figs. 2–5.

From the foregoing it will be now appreciated that there has been provided a sliding door support and guide member which supplies all of the necessary and desirable features in a bathroom or medicine cabinet.

What is claimed is:

1. In a cabinet of the class described the combination with a cabinet having an open front end, of a U-shaped trackway comprising a base and arms normal to the base adjacent the cabinet open front end, a sliding door having a portion thereof in said trackway and of less width than the space between the trackway arms, said door portion within the trackway including a frame disposed within the trackway between its arms, and means carried by said door frame projecting therebelow and laterally thereof for respectively supporting the door upwardly of the trackway base and engaging the trackway arms for spacing the door from said trackway arms and guiding the said door in its movement in the trackway.

2. In a cabinet of the class described the combination with a cabinet having an open front end, of a U-shaped trackway adjacent the cabinet open front end including an upper and a lower course and each of said U-shaped

trackway courses comprising a base and arms normal to the base, a sliding door having a portion thereof in said trackway and of less width than the space between the trackway arms, said door portions within the trackway including a frame, at least, at the upper and lower ends thereof, respectively disposed within the upper and lower courses of the trackway between its arms, means carried by said door frame projecting therebelow and laterally thereof for respectively supporting the door upwardly of the lower course trackway base and engaging the lower course trackway arms for spacing the door from said trackway arms and guiding the said door in its movement in the trackway, and additional means carried by the door upper frame extending laterally of the door for engaging the upper course trackway arms guiding and positioning the door in said trackway upper course.

3. In a cabinet of the class described the combination with a cabinet having an open front end, of a U-shaped trackway comprising a base and arms normal to the base adjacent the cabinet open front end, a sliding door having a portion thereof in said trackway and of less width than the space between the trackway arms, said door portion within the trackway including a frame disposed within the trackway between its arms, means carried by said door frame projecting therebelow and laterally thereof for respectively supporting the door upwardly of the trackway base and engaging the trackway arms for spacing the door from said trackway arms and guiding the said door in its movement in the trackway, and additional means projecting outwardly of the door for acting as bumpers.

4. In a cabinet door guide the combination of a pair of trackways with each trackway including a base and opposed parallel arms normal to the base and with each trackway having an upper and a lower course, a mirror door for each trackway and respectively having a portion thereof in its trackway, a frame member carried by each door at its upper and lower end and respectively disposed in the upper and lower courses of its trackway, means carried by each upper and lower frame member to project laterally of the door into guiding contact with its trackway arms, and means downwardly projecting from each door lower end frame adjacent each end thereof for spacing said frame and door from the base of its trackway lower course.

5. In a cabinet door guide the combination of a pair of trackways with each trackway including a base and opposed parallel arms normal to the base and with each trackway having an upper and a lower course, a mirror door for each trackway and respectively having a portion thereof in its trackway, a frame member carried by each door at its upper and lower end and respectively disposed in the upper and lower courses of its trackway, a member at each corner of each door carried by the upper and lower frame members to project laterally of the door into guiding contact with its trackway arms, and means downwardly projecting from the members carried by each door lower end frame member adjacent each end thereof for supporting and spacing said frame and door from the base of its trackway lower course.

6. In a cabinet door guide the combination of a pair of trackways with each trackway including a base and opposed parallel arms normal to the base and with each trackway having an upper and a lower course, a mirror door for each trackway and respectively having a portion thereof in its trackway, a frame member carried by each door at its upper and lower end and respectively disposed in the upper and lower courses of its trackway, a member at each corner of each door carried by the upper and lower frame to project laterally of the door into guiding contact with its trackway arms, and said member projecting outwardly of each corner of each door as a bumper for said doors, and means downwardly projecting from the members carried by each door bottom end frame member adjacent each end thereof for supporting and spacing said frame and door from the base of its trackway lower course.

7. In a cabinet door guide the combination of a pair of trackways with each trackway including a base and opposed parallel arms normal to the base and with each trackway having an upper and a lower course, a mirror door for each trackway and respectively having a portion thereof in its trackway, a frame member carried by each door at its upper and lower end and respectively disposed in the upper and lower courses of its trackway, and means carried by each door upper and lower frame for supporting and guiding contact with its trackway courses, comprising a member carried by each door upper and lower frame element at each end thereof having a T-shape in plan with a transversely extending arm projecting outwardly, laterally, of the frame member and door engaging the trackway arms for transversely positioning each door in its upper and lower trackway course and spacing said doors from said trackway arms, and each of said members carried by said doors lower frame elements having a lug projecting therefrom below the said doors lower frame elements for spacing said doors and lower frame elements from the trackway base.

8. In a cabinet door guide the combination of a pair of trackways with each trackway including a base and opposed parallel arms normal to the base and with each trackway having an upper and a lower course, a mirror door for each trackway and respectively having a portion thereof in its trackway, a frame member carried by each door at its upper and lower side and respectively disposed in the upper and lower courses of its trackway, and means carried by each upper and lower frame to project laterally of the door into guiding contact with its trackway arms, and means downwardly projecting from each door bottom side frame adjacent each end thereof for spacing said frame and door from the base of the trackway lower courses, and projecting outwardly of each corner of each door for engaging the trackway ends as abutments therefor, comprising a member carried by each door upper and lower frame element at each end thereof and disposed between the door and said frame elements and each member having a T-shape in plan with a transversely extending arm projecting outwardly, laterally, of the frame member and forwardly of the door engaging the trackway arms for transversely positioning each door in its upper and lower trackway course and spacing its door from said trackway arms, each of said members carried by said doors lower frame members having a supporting lug projecting therefrom below the said doors lower frame members for spacing said doors and lower frame members from the trackway base, and each door lower frame member having an aperture through its base for each of its supporting and guiding members and through which the supporting lug of said members projects for securing said members in operative positions.

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