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SLIDING DOOR HANGER DEVICE

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Fig. 1

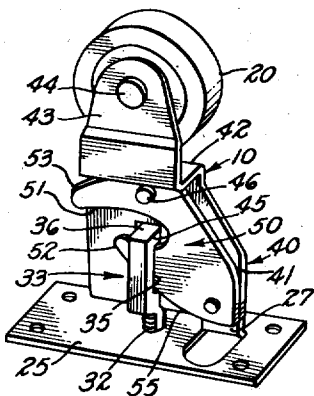


Fig. 2

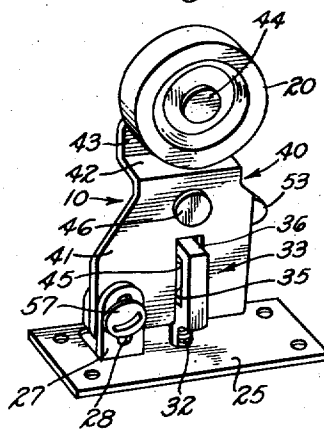


Fig. 3

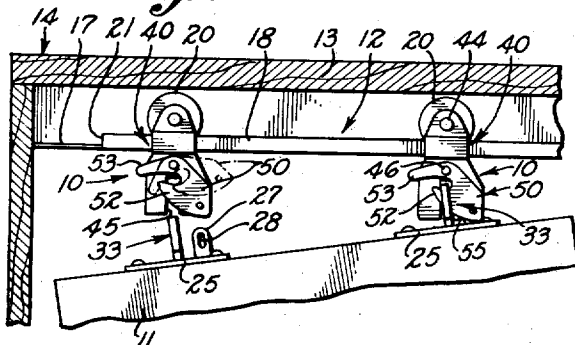


Fig. 4

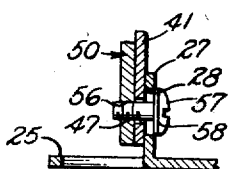
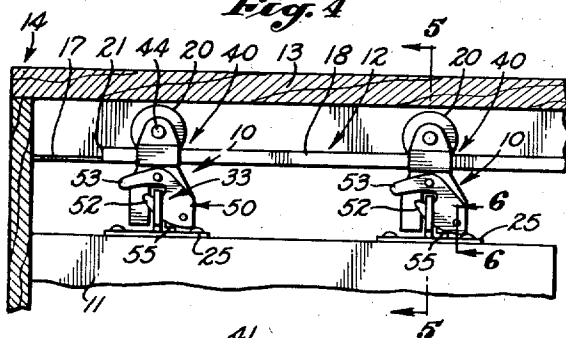
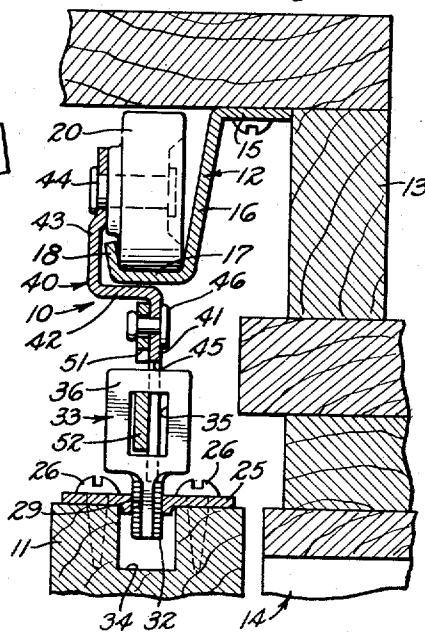


Fig. 6

Fig. 5



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SLIDING DOOR HANGER DEVICE

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6 Claims. (Cl. 16—89)

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This invention relates generally to builders' hardwood and particularly to hanger means for supporting doors of the so-called overhead sliding type. Specifically, the invention pertains to hanger devices for suspending such doors from an overhead track along which the doors move to open and close a doorway.

Various hanger means have been employed in the past for suspending doors from overhead tracks extending across the top of doorway frames, such hanger means usually including hanger brackets secured to the upper edge of the door and rollers carried by the brackets and rollable along the tracks to mount the doors for sliding movement across doorways. Such prior hanger devices are subject to several disadvantages. In the first place, many such devices have no means for adjusting the rollers vertically so that leveling of the door is extremely difficult. Other proposed hanger devices have adjusting means but these are not readily operated and are very complicated in construction. Another hanger device has an eye member which is carried by and adjustable vertically of a door, a hanger member carrying rollers which are rollable along an overhead track, and at least one gravity-actuated latch member, in the form of a hook pivoted on the hanger member, adapted to engage in the eye member when the door is raised toward the track so as to suspend the door from the track. By adjusting the eye members, the door can be readily leveled, the latch members of the hanger devices being manually released from engagement with the eye members to permit such adjustment. It has been determined that when the door is subjected to unusually rough operation, that is, impelled to open and closed positions with unnecessary force, the latches are apt to be accidentally pivoted to inoperative position and thereby release the door. Moreover, since the hanger members are relatively loosely connected to the door through their latches and the eye members, slight twisting of the door on vertical axes is possible and this may allow shaking or rattling of the door. Furthermore, in the door hanger device last referred to a plurality of rollers are employed, these rollers being angularly disposed with respect to the horizontal and vertical to adapt them to roll along the inclined faces of the overhead track and, since the weight of the door is thus applied at an angle to the rollers and their spindles, undesirable wear may occur in the wheels and their mounting means.

It is a primary object of this invention to obvi-

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ate the deficiencies of prior door hangers by providing a hanger device which is particularly adapted for use in connection with a track having a horizontal surface along which a single roller of the device is adapted to roll. A related object is to provide a hanger device in which the single roller is rotatable on a horizontal axis and thus is disposed with its plane in alignment with the plane of the door to which the device is applied so that downward force of the door is applied evenly to the roller to avoid rocking thereof.

Another object of the invention is to provide a hanger device to which the door may be readily attached and from which the door may be removed when the device is in place on the overhead track, the device having a vertical slot for receiving a keeper member carried by the door at its upper end so that the door can be conveniently hung by simply moving it upwardly to dispose a cross-bar of the keeper member within the slot. A related object is to provide a device of the character referred to which includes a locking member or latch pivoted on the hanger member having the slot, said latch having a hook portion normally extending across the slot and adapted to hook through the keeper member to suspend the door from the track, the latch being further provided with a cam edge adapted to be engaged by the keeper member to displace said hook portion during insertion of the keeper member into the slot.

Another important object of the invention is to provide a hanger device of the type indicated which includes locking means for locking the latch in its operative position so as to preclude accidental disconnection of the door from the device. In a preferred construction, the locking means comprises a mounting plate secured to the upper edge of the door and having an upstanding ear, and a binder screw passing through aligned holes in the ear and the hanger member and screwed into a threaded hole in the latch with the head of the screw abutting a side of the ear. By this connection, a single screw provides means for both locking the latch in operative position and connecting the door to the hanger member so as to prevent relative rotation therebetween.

Another object is to provide a hanger device in which the keeper member is screwed into the mounting plate so that the cross-bar of the member can be adjusted vertically to level the door, the hole in the mounting plate ear being elongated to permit locking of the components in their adjusted positions by the binder screw.

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A still further object is to provide a hanger device which is relatively simple in construction, one which is strong and durable, one which may be manufactured at a low cost by mass production methods, and one which greatly facilitates hanging of a door by one not especially skilled in the art.

Further objects will appear from the following specification, and from the drawing, which is intended for the purpose of illustration only, and in which:

Fig. 1 is a perspective view of the improved door hanger device, as observed from one side thereof;

Fig. 2 is a similar perspective view, as observed from the opposite side of the device;

Fig. 3 is a fragmentary longitudinal sectional view of the upper portion of a door frame, illustrating the manner in which a door is installed in the frame;

Fig. 4 is a view similar to Fig. 3, showing the door completely suspended from a track of the door frame by means of the hanger devices;

Fig. 5 is an enlarged cross-sectional view, taken on line 5-5 of Fig. 4; and

Fig. 6 is an enlarged cross-sectional view, taken on line 6-6 of Fig. 4.

Referring to the drawings in detail, the present improved hanger devices 10 are adapted for use in suspending a door 11 from a metal track 12 which extends longitudinally within the header 13 of a door frame 14. As shown best in Fig. 5 the track 12 preferably is substantially Z-shaped in cross section and has an upper flange 15 which is secured to a surface of the header 13, an inclined, intermediate web 16 and a lower horizontal flange 17 having an upwardly bent lip 18. The flange 17, lip 18 and web 16 define between them the channel-shaped track 12 along which the roller 20 of each hanger device 10 is adapted to roll, the lip 18 being cut away at one end of the track to provide a re-entrant opening 21 through which the rollers can be inserted into the track.

Each hanger device 10 includes a first hanger member or metal mounting plate 25 which is adapted to be secured against the upper end surface of the door 11 by means of screws 26. Adjacent one end of the plate 25 the metal is slit and bent upwardly to provide an ear 27, the ear being provided with a vertically extending, elongated opening 28 (Figs. 2 and 6). The plate 25 has a centrally disposed, screw-threaded hole 29 (Fig. 5) into which the lower threaded end 32 of a keeper member 33 is adjustably screwed, the end 32 extending through the hole and into a recess 34 in the door. The keeper member 33 has a rectangular aperture 35 which provides an upper cross-bar or keeper bar 36.

Each hanger device 10 also includes a second hanger member 40 which may be conveniently stamped from sheet metal and bent to the required form in a suitable die. The member 40 has a lower vertically extending portion 41, an intermediate horizontal portion 42 and an upper vertically extending portion 43, the latter portion thus being disposed in a vertical plane which is offset laterally with respect to the plane of the lower portion 41, the amount of offset being substantially equal to one-half the thickness of the roller 20. The roller is preferably made from rubber or other resilient material and is rotatably mounted on a pin or spindle 44 carried by the upper offset portion 43 of the hanger member 40. The lower portion 41 is provided with a vertical slot 45 adapted to receive the eye mem-

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ber 33. Adjacent its upper end, the lower portion 41 carries a pivot pin 46 and adjacent a lower corner is provided with an aperture 47 (Fig. 6).

Pivoted on the pin 46 is a third hanger member or latch 50 which is preferably made from sheet metal. The latch 50 is cut away at one side to provide a curved slot 51, the portion of the latch immediately below the slot providing a hook 52. The portion of the latch immediately above the slot 51 extends laterally to a considerable distance from the pivot pin 46 to provide a finger-piece 53 by which the latch can be manually pivoted on the pin. It is to be noted that the latch 50 is so shaped that its center of gravity is disposed laterally and downwardly of the pivot pin 46, that is, at the right-hand side of the pin, as viewed in Figs. 1, 3 and 4, so that the latch is pendulously mounted and normally assumes a position in which its hook 52 extends across the slot 45 of the hanger member 40 (Figs. 1 and 3), due to the influence of gravity. The lower edge of the latch 50 is curved downwardly and laterally from the tip of the hook 52 to provide a cam edge 55. At its lower right-hand portion, the latch 50 is provided with a screw-threaded hole 56 (Fig. 6).

As will be noted by reference to Fig. 1, when the hanger device is applied to use the keeper member is disposed in the slot 45 of the member 40 and the hook 52 of the latch extends through the opening 35, that is, beneath the cross-bar 36, to retain the components in corrected relationship. The present invention further provides locking means for locking the latch in its operative position following assembly of the parts of the device. The locking means consists of a binder screw 57 (Figs. 2 and 6) having a head adapted to abut a side of the ear 27 and a threaded shank which passes through the elongated opening 28 and the aperture 47 and is screwed into the hole 56 of the latch. By this means, tightening of the binder screw 57 draws the several parts 27, 41 and 50 together so as to prevent relative movement therebetween and thus effects a rigid, unitary structure. A lock washer 58 is preferably disposed between the head of the screw 57 and the ear to resist loosening of the screw.

Assuming that it is desired to install the door 11 for sliding movement within the door frame 14, the door is equipped with a pair of the hanger devices 10 and hung from the track 12 of the door frame in the manner to be next explained. A recess 34 is first bored in the upper end of the door 11 adjacent each end thereof, after which a pair of the mounting plates 25 is secured to the door by the screws 26, the plates overlying the recesses with their threaded holes 29 aligned therewith. The keeper members 33 are next connected to the plates 25 by screwing their threaded shanks 32 into the holes 29. Preferably, the keeper members 33 are screwed downwardly into engagement with the upper surfaces of the mounting plates 25, after which they are unscrewed or backed off one full turn.

The upper assemblies of the pair of hanger devices 10, including the members 40, rollers 20 and the latches 50, are next positioned within the door frame 14 and this is readily accomplished by simply inserting the roller of each assembly through the re-entrant opening 21 and then sliding each assembly laterally to dispose its roller upon the flange 17 of the track 12 for rolling movement therealong, as shown in Fig. 3. The door 11 is next placed in upright position within

the doorway with one of the vertical edges of the door disposed within the pocket or enclosure of the door frame 14.

One of the hanger assemblies 20, 40, 50 is next rolled along the track 12 to a position directly above one of the plates 25, after which the door is tilted to cause the keeper member 33 at this side to enter the vertical slot 45. As the side of the door is thus raised, the cross-bar 36 of the keeper member 33 engages the cam edge 55 of the latch 50 and pivots the latter on its pivot 46 to allow the cross-bar to move upwardly to a position above the hook 52, at which time the latch pivots back to initial operative position in which its hook underlies the cross-bar. One side of the door 11 is thus suspended from the track 12. The other side of the door is then connected to the other hanger assembly 20, 40, 50 by simply raising this side to cause the keeper member at this side to enter the slot 45 thereof and to be retained therein by the gravity-actuated latch 50.

By the procedure outlined above, the door 11 is suspended from the track 12 and this is adapted to slide within the door frame with the rollers 20 rolling along the track.

The door 11 is now slid to closed position to check the levelness thereof and this is readily determined by observing whether the stile of the door is flush with the exposed bumper jamb of the door frame. In the event that the vertical edge or stile and the jamb are misaligned, the door 11 is unhooked from the assembly 20, 40, 50 at this edge and the keeper member 33 is adjusted upwardly or downwardly, as may be necessary to properly align the stile with the jamb, and following such adjustment the keeper member is again engaged with the latch hook 52. As will be apparent, pivotal movement of the latch 50 to free the keeper member 33 for the purpose of adjustment may be conveniently accomplished by pressing a finger against the fingerpiece 53 thereof.

After the proper alignment has been obtained, a binder screw 57, and lock washer 58, are applied to each hanger device 10 by inserting the shank of the screw through the elongated opening 23 and the aperture 47 and screwing it into the hole 56 of the latch 50. It is thus seen that by this means each latch 50 is retained in its operative position to prevent displacement of the keeper member 33 from the slot 45, even when the door is thrown roughly or slammed to its open or closed position. In addition, the binder screws 57 rigidly connect the components 25 and 40 so that loose fitting, which might result in rattling of the door during use, is effectively avoided.

With the door 11 thus installed, it is ready for use and may be readily moved across the doorway by a minimum of physical effort, due to the fact that the rollers travel freely along the track. It will be observed by reference to Fig. 5 that each roller 20 fits closely within the channel-shaped track 12 so that lateral and vertical movement of the roller is minimized. It will also be noted that the roller 20 of each device 10 is disposed in a plane which is in alignment with the plane of the door and at the transverse center thereof so that the door is perfectly balanced. By this provision, transverse tilting of the door, which would cause wear between the contacting surfaces of the door and the door frame, is entirely avoided. Moreover, since the various components of the hanger devices are rigidly locked together, looseness in the mounting and discon-

nection or release of the door is prevented. Furthermore, as will be apparent from the foregoing, the door can readily be installed and removed by a person not especially skilled in the art. To remove the door 11 for any purpose, such as for painting the same, the usual door stops or molding strips of the door frame are removed, after which the hanger devices 10 are loosened by withdrawing the binder screws 57 and pivoting the hook-like latches to inoperative position to release the door. When removing the door, the setting of the keeper members 33 is not disturbed so that when the door is later re-installed, re-adjustment thereof is unnecessary.

While the hanger device has been herein disclosed as embodied in a preferred embodiment by way of example, it will be apparent that various modifications might be made therein without departing from the spirit of the invention. Consequently, I do not wish to be limited in this respect but desire to be afforded the full scope of the appended claims.

I claim as my invention:

1. A hanger device for suspending a slidable door from a horizontal overhead track, comprising: a first hanger member adapted to be secured to the upper end of the door, said first hanger member having an upstanding ear provided with an elongated opening; a keeper member adjustable vertically on said first hanger member and providing a transverse keeper bar; a second hanger member projecting upwardly from said first hanger member and having a vertical slot for receiving said bar of said keeper member, said second hanger member having an aperture; a single roller rotatably mounted on said second hanger member at one side only thereof, said roller being disposed with its plane in alignment with the plane of the door at the transverse center thereof and adapted to roll along the track; a gravity actuated latch member pivoted on said second hanger member and provided with a hook portion adapted when said latch member is pivoted to an operative position, to underlie said keeper bar to retain said keeper member in said slot, said latch member having a screw-threaded hole; and a locking screw having a head abutting a side of said second hanger member and a threaded shank passing through said elongated opening and said aperture and screwed into said threaded hole to connect said first and second hanger members and to lock said latch member in its operative position.

2. A device as defined in claim 1 in which said latch member is weighted to cause it to normally assume said operative position in which its hook portion extends across said slot under the action of gravity, said latch member having a cam edge normally extending across said slot and adapted to be engaged by said keeper bar so that relative movement of said first and second hanger members toward each other effects pivotal movement of said latch member to its inoperative position so as to displace said hook portion from said slot to allow entrance of said keeper bar into said slot, said latch member being adapted to pivot by gravity to its operative position upon movement of said bar to a position above said hook portion.

3. A device as defined in claim 1 in which said second hanger member has a vertically extending, laterally offset portion, said roller being rotatable on said offset portion.

4. A device as defined in claim 1 in which said

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latch member has a fingerpiece by which it can be manually pivoted to inoperative position.

5. A hanger device for suspending a door from a horizontal, overhead track, comprising: a first hanger member adapted to be detachably connected to the upper end of the door and provided with a horizontal keeper bar extending transversely of the door; a second hanger member projecting upwardly from said first hanger member; a roller rotatably mounted on said second hanger member at one side only thereof, said roller being disposed with its plane in alignment with the plane of the door at the transverse center thereof and adapted to roll along the track; a latch member pivoted on said second hanger member, said latch member having a hook portion underlying said keeper bar to detachably connect said first and second hanger members, said hook portion having a cam edge engageable by said bar, by which said latch member can be pivoted to an inoperative position in response to relative movement of said first and second hanger members toward each other, said latch member being gravity-actuated to adapt it to pivot to an operative position wherein its hook portion normally underlies said bar when said bar is disposed above said hook portion; and locking means for releasably retaining said latch member in its operative position.

6. A hanger device for suspending a door from a horizontal, overhead track, comprising: a first hanger member adapted to be detachably connected to the upper end of the door and provided with a horizontal keeper bar extending trans-

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versely of the door, said first hanger member having an upstanding ear with an elongated opening therein; a second hanger member projecting upwardly from said first hanger member and having an apertured lower portion; a roller rotatably mounted on said second hanger member at one side only thereof, said roller being disposed with its plane in alignment with the plane of the door at the transverse center thereof and adapted to roll along the track; a latch member having a threaded hole therein, said latch member being movably mounted on said second hanger member and engaging said keeper bar to detachably connect said first and second hanger members; and a locking screw extending through said opening in said ear and an aperture in said second hanger member and screwed into said threaded hole in said latch member when said latch member is engaged with said keeper bar so as to rigidly connect said first and second hanger members and said latch member.

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