Dec. 6, 1966 K. A. MILETTE 3,289,243

SLIDING DOOR HANGER

Filed March 19, 1965

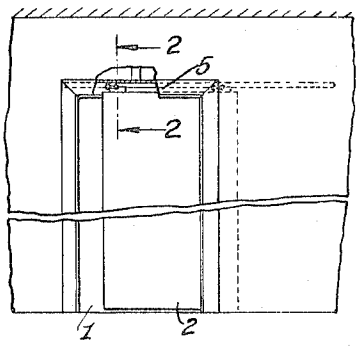


FIG. 1.

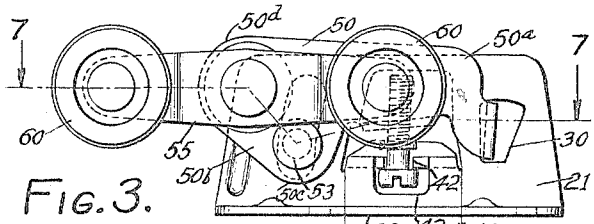


FIG. 3.

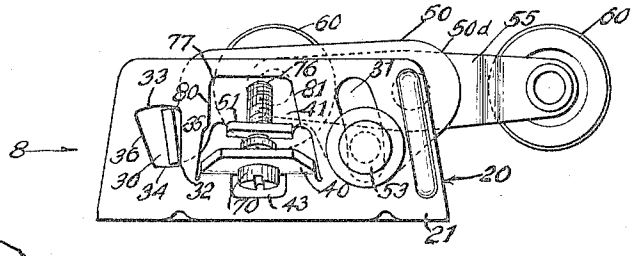


FIG. 4.

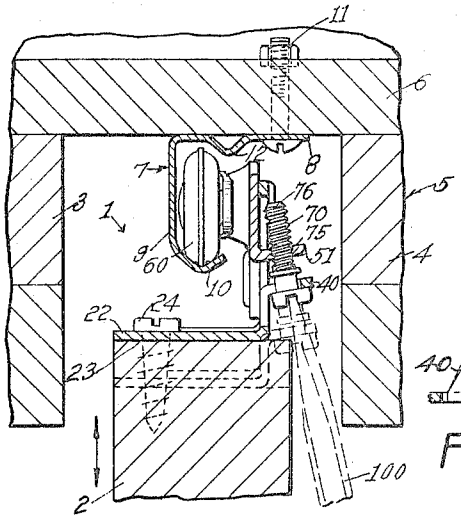


FIG. 2.

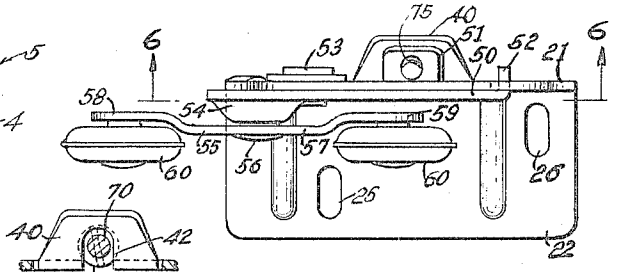


FIG. 5.

FIG. 10.

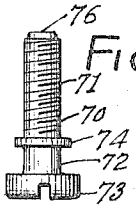


FIG. 9.

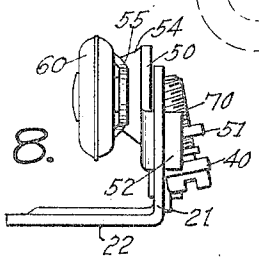


FIG. 8.

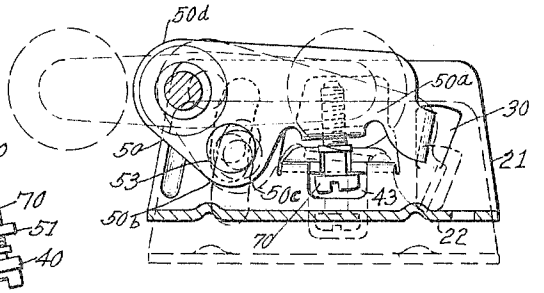


FIG. 6.

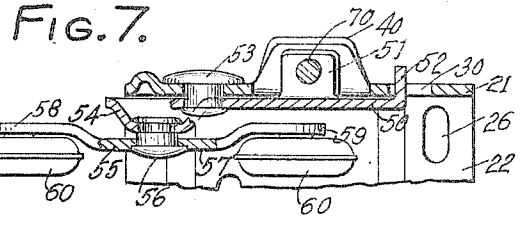


FIG. 7.

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SLIDING DOOR HANGER

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7 Claims. (Cl. 16—105)

The present invention relates to building hardware and specifically to improvements in a sliding door hanger. Sliding doors are universally employed in buildings, dwellings, closets, by way of example, as such doors do not occupy space in a room when opened or closed in the manner of a swing door. However, the hangers for said slide doors are often difficult to install on the door and offer problems when the workmen must plumb the door, particularly if the door is to move over a carpeted floor or must be adjusted for movement over a wooden or cement floor. The present invention solves in an expedient and efficient manner the problems involved in sliding door hanger construction and overcomes the many difficulties before mentioned.

The sliding door hanger of the invention is easily fabricated, inexpensive in construction, readily adjustable to plumb a door to which it is attached, which will maintain its adjustment during use thereof and is generally superior to sliding door hangers now known to the inventor.

A further object is the provision of a sliding door hanger incorporating wheels adapted to run upon a track in such a manner that bending stresses in the nature of a twist are not introduced into the hanger.

A further object is the provision of a sliding door hanger which accommodates itself to door pockets of varying depth while permitting ready adjustment of the hanger to plumb the door.

With the above mentioned and other objects in view, the invention consists in the novel and useful provision, formation, construction, association and relative arrangement of parts, members, and features, all as shown in one embodiment in the accompanying drawing, described generally, and more specifically pointed out in the claims.

In the drawing:

FIGURE 1 is a fragmentary elevation showing a door opening with a slide door for closing said opening and which slide door is carried by the hanger of the present invention;

FIGURE 2 is an enlarged fragmentary cross sectional view on the line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged elevation of one side of the hanger shown as an entirety;

FIGURE 4 is an elevation of the opposite side of the hanger from that shown in FIGURE 3 and on the same scale;

FIGURE 5 is an enlarged top plan view of the hanger on the same scale as FIGURES 4 and 5;

FIGURE 6 is a sectional view on the line 6—6 of FIGURE 5;

FIGURE 7 is a fragmentary sectional view on the line 7—7 of FIGURE 3;

FIGURE 8 is an end elevation looking in the direction of the arrow 8 in FIGURE 4;

FIGURE 9 is an elevation of a collar type screw employed in the present invention; and,

FIGURE 10 is a sectional view on the line 10—10 of FIGURE 3.

In FIGURES 1 and 2 I have shown a doorway 1 and a sliding door 2. As a rule, the framing for the sliding door is pre-fabricated and then inserted between walls of the building structure. The framing is constructed to provide split jambs on both sides of the door pocket, such framing mating with the box head side members 3 and 4 in FIGURE 2. The split jamb construction is followed for the framing and particularly that portion of the framing between the walls to provide a pocket within which the door is received when the door opens the doorway. It is customary in practice to provide over the doorway 1 a box head 5. This box head includes a header or top piece 6 and the box head directly communicates with the door framing pocket situated between opposite walls. To the header 6 in the box head, and within the pocket of the framing is secured a supporting rail or track 7 and which runs the length of said header or top piece. The sliding door hanger is adapted to move upon this track, and accordingly, the door is so positioned and the track and the hanger so related that the door hangs plumb when properly adjusted with opposite sides of the door equally spaced from the box head side members 3 and 4 in single door construction as shown in FIGURE 2.

The supporting rail or track 7 includes a top flange 8, a side web 9 in substantially right angular relationship, and a concavo-convex flange 10 which provides a trackway upon which the hanger moves. The top flange has a width which permits it to be bolted to the header 6 as shown at 11 at spaced points throughout the length of the header. The top flange 8 has longitudinal rib 12 for holding the wheels of the door hanger positioned upon the concavo-convex track or rail as shown in FIGURE 2.

The sliding door hanger 20 for use on the trackway just described includes a bracket having two legs 21 and 22 in substantially right angular relationship. Leg 22 is adapted to be secured to the top edge of the door 2 as shown in FIGURE 2 at 23 such as by means of screws 24 passed through elongated slots 25 and 26 in the leg 22 and into the door. Leg 21 is provided adjacent one end thereof with a substantially polygonal transverse slot 30. Adjacent the opposite end of leg 21 is a transverse arcuate slot 31. The radius of curvature for the radial slot is from a center 32 of slot 30. The bounding sides of the slot 30 at 33 and 34 are substantially parallel although the side 33 may be slightly arcuate while side 35 lies substantially at right angles to side 34 while side 36 is at an obtuse angle to side 34. Located between slots 30 and 31 and extending outwardly from leg 21, which is to say not extending over the leg 22, is a lug 40. Preferably lug 40 is punched from bracket leg 21 and provides the leg with a tranverse slot 41. The lug 40 is transversely slotted at 42. The slot 42 communicates with a slot 43 which lies in the plane of the bracket leg 21, see FIGURES 3 and 6. Slot 43 is of greater width than the slot 42. Slot 42 is of the blind type and terminates inward from the outer edge of the lug as shown in FIGURE 10.

Secured to the leg 21 is lever 50 which is provided substantilly intermediate its length with an outstanding lug 51. Lug 51 is canted slightly and tipped upwardly relative to the plane of the lever 50. The lug 51 is adapted to overlie the lug 40.

The lever 50 has intermediate its length a narrow end section 50*a* terminating in an angular ear 52 which passes through slot 30, see FIGURES 5 and 7. The narrow section 50*a* merges into a wide end section 50*b* of substantially triangular form.

A slide type rivet 53 is secured to the wide section 50*b* at the vertex portion 50*c* of the lower edge of the lever. The rivet 53 is passed through the arcuate slot 31 in leg 21, and the rivet has a large head which straddles the slot 31 and has loose bearing engagement with the leg. The lever 50 adjacent the vertex 50*d* of the enlarged section is provided with a boss 54. The boss 54 has a central hole and the rocker arm 55 is secured to the boss by a rivet 56 or equivalent means. The rocker arm comprises a strap having a central portion 57 and two offset

end portions 58 and 59, the offset ends lying in the same plane and the offset ends have secured thereto rotatable wheels 60 secured by means of rivets or the equivalent.

To provide for adjustment of the lever 50 and its swing movement relative to the bracket leg 21, a collar type screw as shown in FIGURE 9 is provided, which screw is designated as an entirety by 70. The screw has a screw threaded shank 71 and an unthreaded area 72 interposed between the head 73 and a collar 74. The unthreaded area 72 between the head and collar is received within the slot 42 of the lug 40 so that the screw may have limited rocking movement therein. As shown in FIGURE 2, the lug 40 is tipped upwardly relative to the plane of the leg 21 and in this instance at approximately a 10° angle. The lug 51 is also tipped upwardly a like amount of 10° relative to the plane of the lever 50. Lug 51 is provided with a transverse screw threaded bore 75 for reception of the threaded portion 71 of the screw 70. The length of the shank of the screw from the head 73 to the end of the screw is such that the screw end 76 does not strike or engage the bounding side 77 of slot 41. In addition to the angle of the lugs for the bracket and lever 50, the lug 51 as previously mentioned is canted relative to the base and top edge of leg 21 of the bracket. This angle may be in the order of 8° as illustrated in FIGURE 4. This lug is canted for the reason that the lug moves within the slot 41 as the screw head is turned to raise or lower the lever relative to its traveling pivot or fulcrum point within the slot 30. It will be observed upon viewing FIGURE 4 that the slot 41 is so formed as to permit the lug 51 to swing within the same without the sides bounding the slot interfering with such movement. By way of example, and assuming that the top and bottom edges of the leg 21 are horizontal, the bounding edge of the slot at 80 may be 90° to horizontal while the opposite bounding edge 81 may be at an angle of 15° to vertical. This construction is sufficient to allow free rocking movement of the lug.

The operation, uses and advantages of the invention are as follows:

The bracket is strengthened by providing the same with elongated ribs as shown in FIGURES 4, 5 and 6.

Assuming that the supporting rail or track has been attached to the header both above the doorway and within the pocket and that the track is level, the hangers are secured to the top edge of the door as shown in FIGURE 2. In the instance shown the leg 22 has its outer edge flush with one surface of the door 2 while the leg 21 is inward from the opposite surface of the door. It is essential in positioning the bracket relative to the door that when the wheels of the rockerarm are engaging the track and particularly the concavo-convex portion at 10, that the door will hang plumb and not tend to swing outwardly or inwardly. Thus the center of gravity of the door should pass through the wheels on the rockerarm. It is for this reason that the slots 25 and 26 in the leg 22 are elongated to provide for transverse bracket adjustment. Assuming that the bracket has been properly adjusted relative to the door as shown in FIGURE 2, by way of example, it will be noted that the kerf of the screw and the axis of the screw is such that the screw driver indicated at 100 may engage the screw kerf to regulate lever 50 in its swing movement relative to bracket leg 21. Thus, I provide for a steeper screw angle and in this instance the axis of the screw has an angle of 10° relative to the lugs and to a side of the door. Hence, it follows that a very deep box head pocket may be utilized and still allow proper adjustment of the door to plumb the same. Ordinarily two of the hangers would be utilized adjacent side edges of the door and the adjusting screws 70 are turned to bring the lever 50 to the position shown in FIGURES 3 and 4 which is to say that the rivet 53 is at its lowest position within the slot 31. To install the door 2 within the header at the door opening 1, the door operator holds the door at an angle to vertical and in such a position that the lip of the track, to wit, the outer end of the concavo-convex portion 10 points away from the operator. The rollers are then brought into engagement with the track by lifting the door upwardly and toward the operator to permit the wheels to drop within the track whereupon the door is allowed to swing into position in the doorway. The door is then plumbed above the threshold by adjusting the screws 70 for the different brackets used in the manner shown in FIGURE 2. In this connection, I have found it preferable to use a modified Phillips headed screw as such a screw head allows better access by the screw driver and aids in preventing a marking of the door.

It is obvious that I may utilize a single wheel pinned to the boss 54 in place of the rockerarm 55 carrying a pair of wheels, the device otherwise functioning as has been described.

Several features of the sliding door hanger are important. The enlarged section of lever 50 at its maximum width is substantially equal to the width of leg 21 of the bracket and this enlarged section is in juxtaposition to a surface of the leg 21 and may bear thereagainst. This construction in addition to the slot 31 in the leg and the rivet connection between the enlarged section with the leg through the slot 31 stabilizes movement of the lever 50 as it tends to pivot relative to its fulcrum or pivot point, to wit, the connection between the ear 52 of the lever and the slotted area 30 of leg 21. The wheeled rockerarm 55 is pivoted to lever 50 above and to one side of the rivet connection 53 of said lever to leg 21 at the arcuate slotted portion 31 of said leg. The enlarged section which has bearing engagement with leg 21, the screw adjustment between lugs 40 and 51 which lies intermediate the rivet connection with the leg at 53, plus the pivot connection afforded by the ear 52 within the slot 30, all cooperate and function to prevent any twist in the lever and rockerarm when the wheels of said rockerarm are engaging a trackway and supporting the weight of a door. Hence, I provide an assembly which moves easily without binding and wherein the material for fabricating the bracket and associated parts may be of light gauge metal.

In many constructions the box head is provided on its interior with stop stripping. The stop stripping reduces the space between the outer surfaces of the door and the interior of the jambs 3 and 4 with the result that the sliding door hanger within the box head is not observed by an onlooker. If stop stripping is not utilized, the spacing between sides of the door at the upper end thereof and the jambs is still reasonably close and sufficient to allow a screw driver such as 100 to engage the kerf of the screw 70 for adjustment purposes, this for the reason that the screw driver may be held in a position that is almost vertical as shown in FIGURE 2.

I claim:

1. A sliding door hanger for movement upon a trackway, including: a bracket having two legs in angular relationship, one leg adapted to be attached to the top edge of a door in horizontal position and the other leg being vertically disposed above the top edge of the door, said vertically disposed leg provided with spaced apart transverse and arcuate slots and with a transverse slot intermediate the aforementioned slots, a lever one end of which is provided with an ear for passage through the transverse slot of the leg to provide a fulcrum point for the lever and likewise provided with attachment means for slide movement within the arcuate slot, the arcuate slot being concentric about the fulcrum point said lever formed with a lug extending through the intermediate slot of the leg, a lug extending outwardly from the vertical leg of the bracket at the intermediate slot, the lug of the lever overlying said last named lug, means extending between the two lugs for adjusting relative separation and approach thereof to swing the lever about its fulcrum point and to move the attachment means in said arcuate slot and a rockerarm provided with wheels secured to the lever at the end opposite the fulcrum point.

2. A sliding door hanger, including: a bracket having two legs in substantially right angular relationship, one leg adapted to be horizontally mounted on the top of the door and the other leg extending vertically above the door, a lever pivotally mounted at one end thereof to the vertical leg of the bracket, means slidably connecting the lever to the vertical bracket leg adjacent the opposite end of the lever for swing movement, the lever and the vertical bracket leg being in bearing engagement and a wheel carried by the lever, and means positioned between the pivot point and the means slidably connecting the lever for adjusting the swing movement of the lever relative to the bracket.

3. The device as set forth in claim 1: said means extending between the two lugs for adjusting relative separation and approach thereof comprising a screw having a collar and a head between which members the lug of the vertical leg of the bracket is received.

4. The device as set forth in claim 1: said means extending between the two lugs for adjusting relative separation and approach thereof, comprising: a collar type screw having a head, and the lug of the vertical leg of the bracket being slotted to position the lug between the collar and the head of the screw.

5. A sliding door hanger for movement upon a trackway, including: a bracket for attachment to the top edge of the door, the bracket having a vertical leg, a lever having an enlarged section and a narrow section, both sections lying in the plane of the lever, and means to fulcrum the narrow section of the lever to the bracket leg, the bracket leg provided with an arculate slot concentric about the fulcrum point, and means secured to the enlarged section of the lever for connecting the lever for bearing engagement with the leg through the arcuate slotted portion, means for adjusting the lever for movement about its fulcrum point and wheel means secured to the enlarged section of the lever.

6. A sliding door hanger for movement upon a trackway, including: a bracket for mounting to the top edge of a door and having a vertical leg, a lever, a wheeled rockerarm pivotally mounted to one end of said lever, means to fulcrum the opposite end of the lever to the vertical leg of the bracket, said vertical leg of the bracket provided with an arcuate slot concentric about the fulcrum point and adjacent the pivot point for the rockerarm, means secured to the lever for passage through the arcuate slot for positioning the lever for bearing engagement with said vertical leg of the bracket, and means positioned between the fulcrum means and the means for securing the lever within the arcuate slot for adjusting swing movement of the lever.

7. A sliding door hanger for movement upon a trackway, including: a bracket adapted to be secured to the top edge of a door and provided with a vertical leg extending above said top edge, a lever and means to fulcrum one end to said vertical leg of the bracket, a rockerarm provided with wheels pivotally secured to the opposite end of the lever, said vertical leg provided with an arcuate slot concentric about the fulcrum point, and said lever provided with a means passed through said arcuate slot for holding the lever in bearing slide engagement with said vertical leg, and means for adjusting the swinging movement of said lever relative to its fulcrum point; said means being positioned intermediate the fulcrum point of the lever with the bracket and the arcuate slot.

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J. H. McGLYNN, *Assistant Examiner.*