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HANGER ASSEMBLY FOR SLIDING DOORS

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The present invention relates generally to hanger assemblies for sliding doors, and it relates more particularly to the type of hanger assembly which facilitates adjustment of the position of a door in an associated door frame.

Hanger assemblies for adjusting sliding doors for movement along a horizontally disposed track are known in the art and are used extensively in the building trade. Because of the difficulty of squaring the track relative to the vertical sides of the door frame, adjustable door hangers not only minimize the time required to initially install sliding doors but result in a better appearing and operating door. Moreover, since sliding doors are commonly installed in new buildings, subsequent settling of the building and drying out of the wood frame members usually necessitates further adjustment of the door from time to time. Accordingly, it is desirable that the door hanger assembly be such as to facilitate periodic adjustment by the occupant, thus avoiding the necessity of hiring skilled technicians.

Therefore, a principal object of the present invention is to provide a new and improved adjustable hanger for sliding door panel and assemblies.

Another object of the present invention is to provide a new adjustable hanger assembly which is relatively inexpensive to manufacture, which is durable in construction, and which may be operated to easily plumb a door relative to its door frame.

Brieferly, the above and further objects are realized in accordance with the present invention by providing a hanger assembly which is adapted to be attached to a sliding door or panel by means of a pair of screws, one of which functions as a pin for the assembly, and which includes a manually rotatable wheel having an integral cam surface thereon for pivoting the assembly about the pin screw to adjust the position of a roller relative to the top of the door.

Further objects and advantages and a better understanding of the present invention may be had by reference to the following detailed description taken in connection with the accompanying drawings, wherein:

FIGURE 1 is a fragmentary, rear elevational view of a sliding door assembly using two hanger assemblies, each embodying the present invention;

FIGURE 2a is a sectional view taken along the line 2—2 of FIG. 1 assuming the entire device to be shown therein;

FIGURE 2b is a fragmentary sectional view of an alternative bracket assembly embodying the present invention and also taken along the line 2—2 of FIG. 1;

FIGURE 3 is an elevational view of a portion of the hanger assembly shown in FIGS. 1 and 2a;

FIGURE 4 is a rear elevational view of a hand wheel and cam member used in the hanger assembly shown in FIGS. 1 and 2a;

FIGURE 5 is a cross-sectional view of the hanger assembly of FIG. 2a, taken along the line 5—5 thereof;

FIGURE 6 is an elevational view of the hanger assembly shown in FIG. 1;

FIGURE 7 is a fragmentary front elevational view of a bracket portion of a hanger assembly of another embodiment of the present invention;

FIGURE 8 is a rear elevational view of a hand wheel and cam member used in conjunction with the bracket of FIG. 7;

FIGURE 9 is a sectional view of the hanger assembly, the parts of which are shown in FIGS. 7 and 8;

FIGURE 10 is a fragmentary elevational view of the hanger assembly shown in FIG. 9;

FIGURE 11 is a fragmentary view of a portion of a hanger assembly embodying another feature of the invention;

FIGURE 12 is a sectional view taken along the line 12—12 of FIG. 11.

Referring now to the drawings, and particularly to FIG. 1, thereof, there is shown a door frame including a vertical casing or jamb member 15 and a horizontal casing member 16 extending at right angles to the jamb member 15. An elongated rail or track 17 is secured to the underside of the frame member 16 by means of a plurality of screws 18 and as best shown in FIG. 2a includes a depending web 19 which is reversibly bent at the lower portion 20 to provide a horizontally extending concave track. A door or panel 21 is slidably supported on the rail 17 by means of a pair of adjustable hanger assemblies 24.

Each hanger assembly 24 comprises a bracket member 25 which is preferably a metal stamping reversibly bent to provide a horizontally extending portion 28 for overlying a portion of the upper edge of the door and to provide an upstanding portion 29. A hole 30 extends through the portion 29 to rotatably receive a roller 32. Preferably, the roller is formed of a plastic such, for example, as nylon and is journaled for free rotation in the bracket 26.

In the hanger assembly shown in FIG. 2a, the portion 28 of the bracket 26 is relatively long thereby to accommodate a relatively thick door having a thickness dimension of, for example, one and three-fourths inches. In FIG. 2b, the bracket has a corresponding offset portion 34 which is extremely narrow since the hanger assembly 24a shown therein is for use with a relatively narrow door having a thickness dimension of, for example, three-fourths of an inch. In other respects, the bracket assemblies of FIGS. 2a and 2b are identical.

In order to attach the bracket 26 to the associated door, there is provided a hole 36 for receiving a wood screw 37. Preferably, the screw 37 has an unthreaded shank portion 38 (FIG. 5) approximately equaling in length the thickness of the bracket 26 whereby with the screw 37 slightly loosened the bracket 26 may be pivoted about the screw 37. In addition to fastening the assembly 24 to the door, the screw 37 thus serves as a pivot.

An arcuate slot 40 is provided in the bracket 26 and the sides of the slot are concentric with the center of the hole 36. A circular handle wheel 42, having an irregular outer peripheral surface 43 to facilitate gripping by means of the fingers, has a centrally disposed hole 45 for receiving a screw type fastener 46. Preferably, the screw 46 has an unthreaded shank portion 47 terminating at its lower end in an annular shoulder 48 for engagement with the face of the door 22 on which the bracket assembly 24 is mounted. As best shown in FIG. 5, the wheel 42 has an integral boss 50 having an external diameter slightly less than the cross-sectional dimension of the slot 40 whereby the bracket 26 may pivot about the screw 37 with the wheel 42 and the screw 46 in place in a slight loosened condition.

In order to pivot the bracket 26 about the screw 37, the bracket 26 is provided with an off-turned tab or cam follower 53 at the lower end of the slot 40. The tab 52 extends, as best shown in FIG. 6, into a spiral camming slot 54 integrally molded in the inner face of the wheel 42. Accordingly, as the wheel 42 is rotated about the screw 46, the cam follower tab 52 rides along the spiral camming groove 54 and moves toward or away from the screw 46 depending upon the direction of rotation of the camming wheel 42. This movement of the cam
follower tab 52 accordingly causes the bracket 26 to pivot about the screw 37 thereby to raise or lower the roller 32. When the roller 32 has been positioned relative to the top edge of the door 22 whereby the door is plumbed with the opening in the door frame, the screws 37 and 46 may be tightened to prevent spurious rotation of the wheel 42 thereby to lock the hanger in the adjusted position.

Although the above-described means for locking the hanger assembly in the adjusted position is satisfactory for some applications, it has been found that after several adjustments of the bracket assembly, a wooden door would not satisfactorily hold the screws 37 and 46 and some locking of the assembly would result. To avoid this problem, it is a feature of the present invention to employ shoulder screws for the screws 37 and 46 and to provide a detent arrangement on the bracket assembly itself to prevent spurious rotation of the camming wheel 42. To this end, the plate 26 is provided with a convex dimple 56, and the camming wheel 42 is provided with a plurality of angularly spaced circular recesses 58 which are adapted to receive the dimple 56 as they are moved into a mutually overlying position. The camming wheel 42 is preferably formed of a resilient material such, for example, as nylon, so that the wheel 42 may flex to permit rotation thereof from one of the holes 58 to the next. In this manner the screws 37 and 46 need not be brought up tightly against the respective parts of the hanger assembly 24 in order to prevent spurious rotation of the wheel 42.

Referring now to the embodiment of the invention illustrated in FIGS. 7 through 10, inclusive, there is shown an alternative embodiment of the invention employing a different type of locking means for preventing spurious rotation of the camming wheel. In FIG. 7, the bracket is designated 26a and may be identical to the bracket 26 of FIG. 3 except that the detent dimple has been eliminated. In FIG. 8, the cam wheel is designated 42a and may be identical to the cam wheel 42 of FIG. 4 except that the recesses 58 are eliminated. Moreover, the wheel 42a has a diameter larger than the wheel 42 relative to the bracket 26a such that the perimeter 61 underlies a portion of the head 62 of the pinlet screw 37. The outer face of the cam wheel 42a is provided with a plurality of semicircular peripheral recesses 64 which, as in the case of the cam wheel 42, provide a finger gripping surface. Additionally, the recesses 64 are adapted to be engaged by the head 62 of the pinlet screw 37 to provide a locking means for the wheel 42a. The amount of engagement between the screw 37 and the wheel 42a may be sufficiently small so that the inherent flexibility of the wheel 42a and the transverse movement of the screw 37 in the door is sufficient to provide the necessary resiliency to permit manual rotation of the wheel past the screw 37. Preferably, however, the head of the screw 37 extends a substantial distance into the recesses so that the screw 37 must be loosened to rotate the wheel 42a. After adjustment, the screw 37 may be tightened a slight amount to fit the head thereof into a respective one of the recesses 64 thereby to hold the camming wheel 42a against spurious rotation. It will be apparent that the degree of tightness is not the same as would be the case if this locking arrangement were omitted and the screw 37 were used to frictionally engage the bracket 26a and to press it against the door.

Referring to FIGS. 11 and 12, there is shown an alternative embodiment of the invention and more particularly the lower portion of a bracket member or plate 70 corresponding in shape to the plate 26 but having a lug 72 crimped into the face thereof in place of the offset lug 52. An arcuate slot 74, shorter in length than the slot 40 is provided for receiving the boss on the associated cam wheel 42 or 42a.

While the present invention has been described in connection with particular embodiments thereof, it will be understood by those skilled in the art that many changes and modifications may be made without departing from the true spirit and scope of the invention. Therefore, it is intended by the appended claims to cover all such changes and modifications as come within the invention.

1. An adjustable hanger for a sliding door or panel assembly comprising, a bracket plate having a hole therein for receiving a mounting screw to attach said plate to a door, said bracket plate having therein an arcuate slot concentric with said hole, a cam follower extending from one face of said bracket, a cam wheel having a central hole therethrough for receiving a mounting screw extending through said slot, said cam wheel overlying said plate and having a spiral cam track thereon facing said one face and receiving said cam follower, and means on said bracket for cooperatively engaging a hanger member to mount said door thereon.

2. An adjustable hanger for a sliding door or panel assembly comprising, a bracket plate having a hole therein for receiving a mounting screw to attach said plate to a door, said bracket plate having therein an arcuate slot concentric with said hole, a cam follower tab extending from one face of said bracket adjacent one end of said slot, a cam wheel having a central hole therethrough for receiving a mounting screw extending through said slot, said cam wheel overlying said plate and having a spiral cam track on the face thereof receiving said cam follower tab, and a roller journaled on said bracket for cooperatively engaging a track member to mount said door thereon.

3. An adjustable hanger assembly for mounting a sliding door or panel assembly in a door opening, comprising a bracket plate member having a planar portion adapted to lie flat against said door, said bracket having an integral portion adapted to extend above said door, a roller journaled in said integral portion for cooperative engagement with a track mounted above said opening, said bracket member having a first opening for receiving said bracket plate member having a planar portion adapted to lie flat against said door, said bracket member having a first opening for receiv-
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a fastening device extending through said hole into said door to pivotally attach said member to said door, a second member, means securing said second member to said door in partial overlying relationship with said first member for rotation about an axis displaced from said hole, and eccentric means interconnected between said first and second members for pivoting said first member about said fastening device in response to rotation of said second member.

8. An assembly as set forth in claim 7 wherein said second member extends into engagement with said fastening device to prevent spurious rotation of said second member.

9. An assembly as set forth in claim 8 wherein said fastening device has a head and said second member partially underlies said head and has a plurality of peripheral recesses for respectively receiving said head.

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