April 4, 1967 J. A. EDEUS 3,311,942

HANGER ASSEMBLY FOR SLIDING DOORS

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FIG. 1.

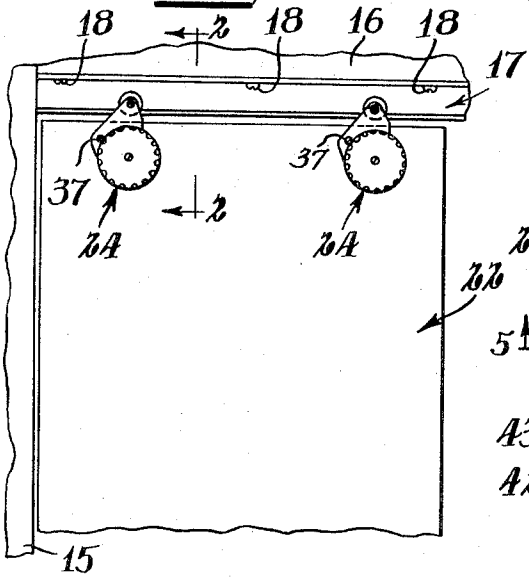


FIG. 2a.

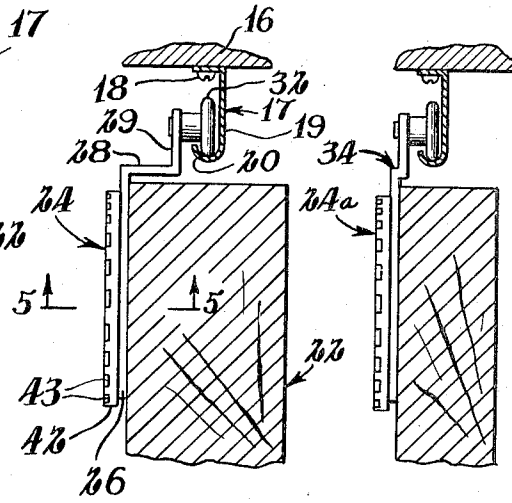


FIG. 2b.

FIG. 3.

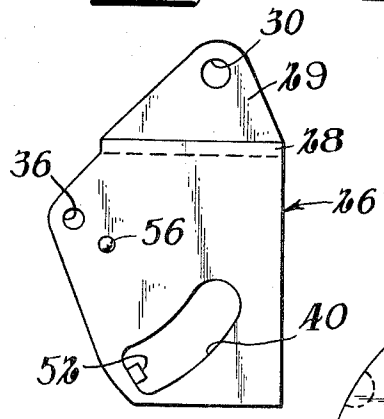
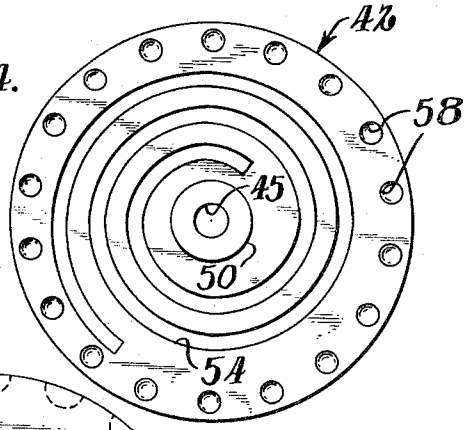


FIG. 4.



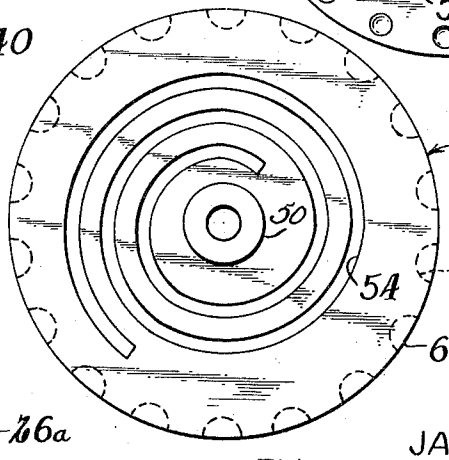


FIG. 7.

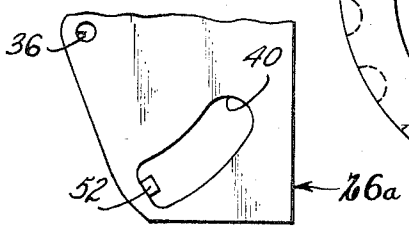


FIG. 8.

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HANGER ASSEMBLY FOR SLIDING DOORS

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FIG. 9.

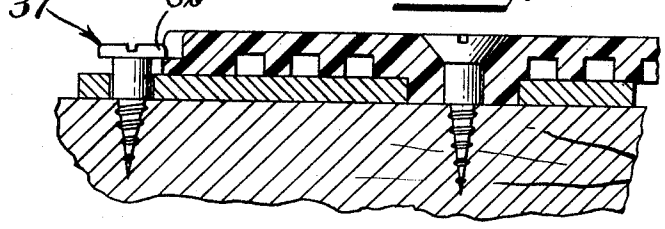


FIG. 11.

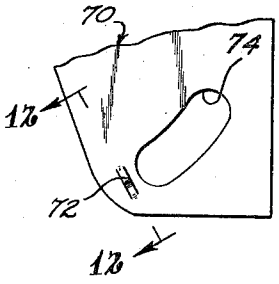


FIG. 5.

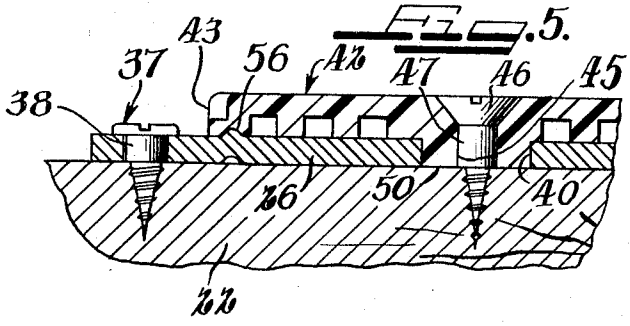


FIG. 12.

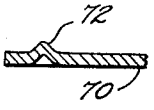


FIG. 6.

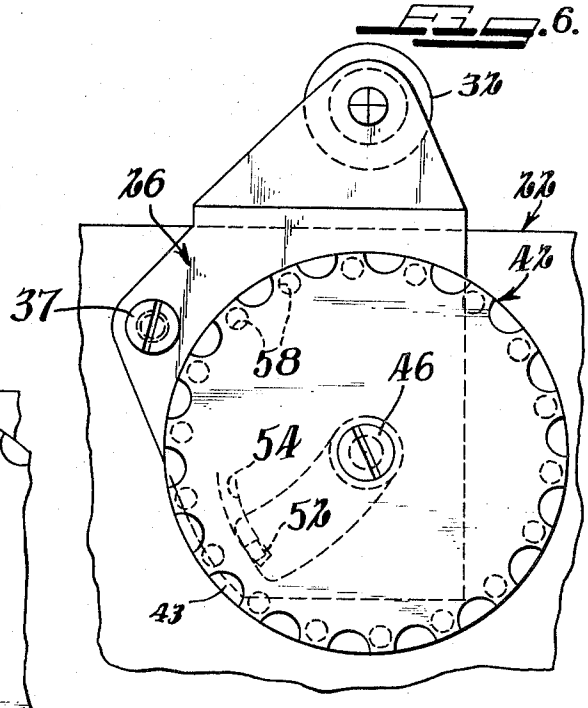
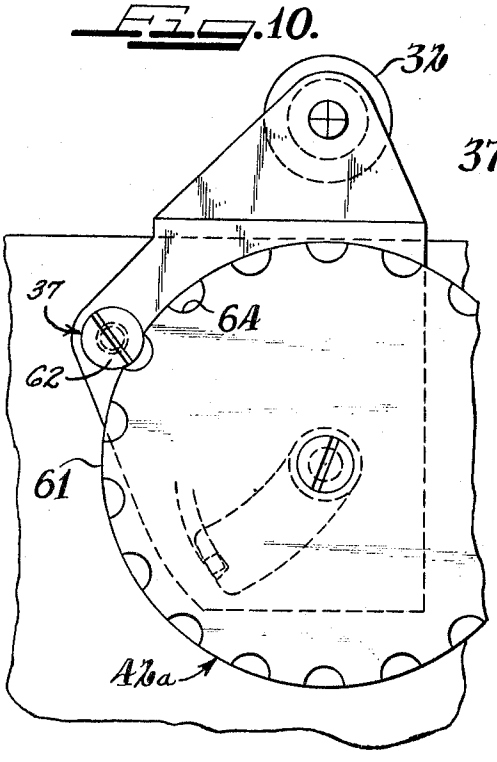


FIG. 10.



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HANGER ASSEMBLY FOR SLIDING DOORS

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9 Claims. (Cl. 16—105)

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 adjustably supporting sliding doors for movement along a horizontally disposed track are known in the art and are used extensively by 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 and panel assemblies.

Another object of the present invention is to provide a new and improved door 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.

Briefly, 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 pintle for the assembly, and which includes a manually rotatable wheel having an integral cam surface thereon for pivoting the assembly about the pintle 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 2*a* is a sectional view taken along the line 2—2 of FIG. 1 assuming the entire device to be shown therein;

FIGURE 2*b* 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 2*a*;

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

FIGURE 5 is a cross-sectional view of the hanger assembly of FIG. 2*a*, 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; and

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. 2*a* includes a depending web **19** which is reversely bent at the lower portion **20** to provide a horizontally extending concave track. A door or panel **22** 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 **26** which is preferably a metal stamping reversely 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 journalled for free rotation in the bracket **26**.

In the hanger assembly shown in FIG. 2*a*, 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. 2*b*, the bracket has a corresponding offset portion **34** which is extremely narrow since the hanger assembly **24***a* 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. 2*a* and 2*b* 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 pintle.

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 hand 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 hanger 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 slightly 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 **52** 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 correspondingly causes the bracket 26 to pivot about the screw 37 thereby to raise or lower the roller 32. When the roller 32 has thus 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 looseness 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 respectively receive the dimple 56 as they are moved into a mutually overlying position. The camming wheel 42 is preferably formed of a slightly flexible and 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 26*a* 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 42*a* and may be identical to the cam wheel 42 of FIG. 4 except that the recesses 58 are eliminated. Moreover, the wheel 42*a* has a diameter larger than the wheel 42 relative to the bracket 26*a* such that the perimeter 61 underlies a portion of the head 62 of the pintle screw 37. The outer face of the cam wheel 42*a* 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 pintle screw 37 to provide a locking means for the wheel 42*a*. The amount of engagement between the screw 37 and the wheel 42*a* may be sufficiently small so that the inherent flexibility of the wheel 42*a* 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 42*a*. 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 42*a* 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 26 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 offturned 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 42*a*.

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.

I claim:

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 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 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 journalled 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 journalled in said integral portion for cooperative engagement with a track mounted above said openings,
said bracket member having a first opening for receiving a first screw extending into said door to pivotally attach said bracket plate to said door,
said bracket plate having a slot therein extending in a direction generally concentric with said opening and spaced a substantial distance therefrom,
a cam wheel member having a central opening therein, said wheel having a boss surrounding said central opening and loosely extending into said slot,
a second screw extending through said central opening into said door,
one of said members having a spiral cam track thereon, and the other of said members having a cam follower thereon operatively engaging said track whereby rotation of said cam wheel pivots said bracket about said first screw to move said roller relative to said door.

4. 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 be flat against said door,
said bracket having an integral portion adapted to extend above said door,
a roller journalled in said integral portion for cooperative engagement with a track mounted above said opening,
said bracket member having a first opening for receiv-

ing a first screw extending into said door to pivotally attach said bracket plate to said door,

said bracket plate having an arcuate slot therein which is generally concentric with said opening and spaced a substantial distance therefrom,

a cam wheel member having a central opening therein,

a second screw extending through said central opening into said door,

one of said members having a spiral cam track thereon, and the other of said members having a cam follower thereon operatively engaging said track whereby rotation of said cam wheel pivots said bracket about said first screw to move said roller relative to said door.

5. An adjustable hanger assembly comprising

a bracket plate having a roller thereon,

means for pivotally attaching said plate to a door about a first axis,

a cam wheel,

means for rotating said cam wheel on said door about a second axis spaced from said first axis, and a cam follower means on said plate engaging said cam wheel

whereby rotation of said wheel pivots said plate on said door to adjust the position of said roller relative to said door.

6. An adjustable hanger assembly as set forth in claim 5, comprising

a dimple on said plate extending toward said cam wheel and said cam wheel has a plurality of angularly spaced indentations for selective engagement with said dimple upon rotation of said wheel thereby to prevent spurious rotation of said wheel.

7. A door hanger assembly comprising

a first member having a hole therethrough,

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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