June 14, 1960 C. B. RISER 2,940,113

SLIDING DOOR HANGER

Filed Feb. 4, 1958

Fig. 1.

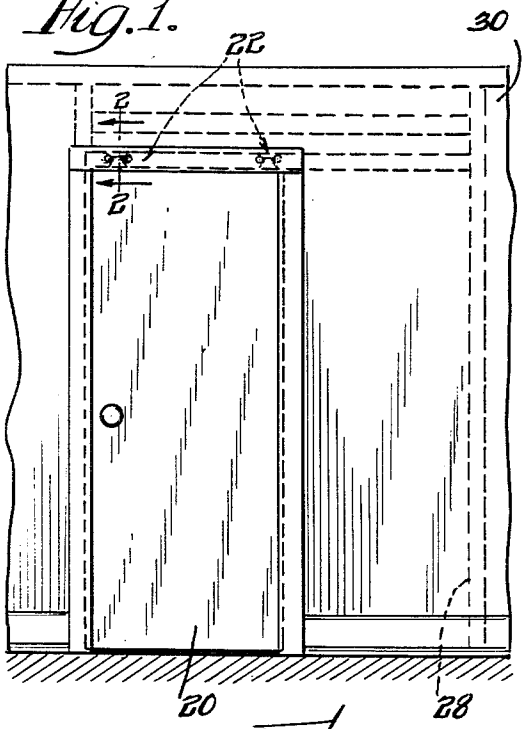


Fig. 2.

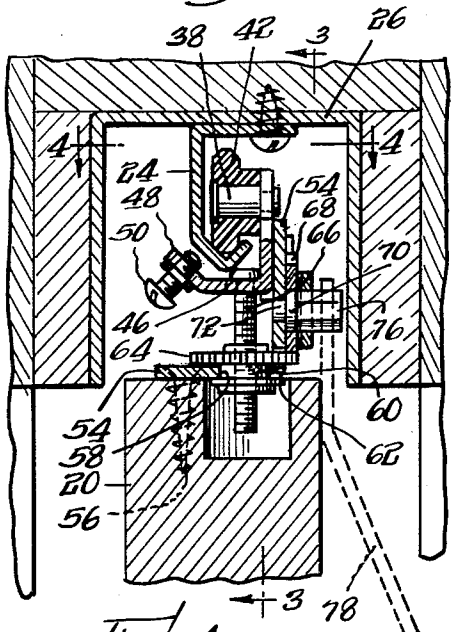


Fig. 3.

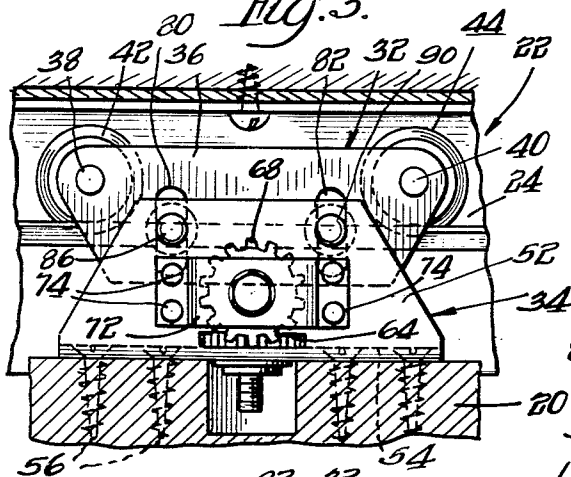


Fig. 4.

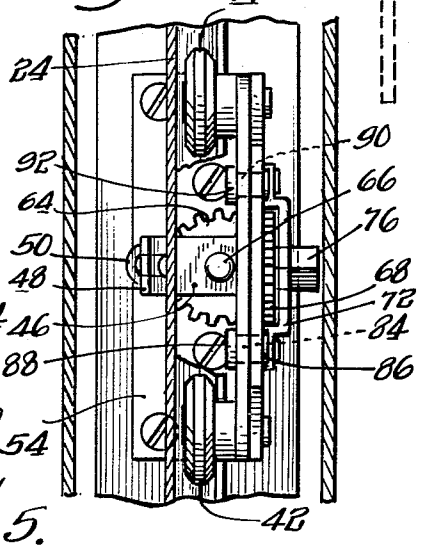
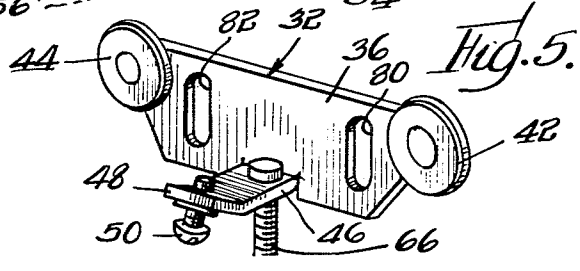


Fig. 5.



INVENTOR.

Clarence B. Riser

BY: Olson & Trevor

attys.

United States Patent Office 2,940,113 Patented June 14, 1960

2,940,113

SLIDING DOOR HANGER

Clarence B. Riser, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill., a corporation of Illinois

Filed Feb. 4, 1958, Ser. No. 713,198

3 Claims. (Cl. 16—105)

The present invention relates to novel door hangers and more particularly to novel wheel hangers for supporting sliding doors.

Sliding doors which are supported from an overhead track by means of wheeled hangers have long been known and used, and one problem which is frequently encountered when mounting such doors is that of vertically adjusting the door so that its lower edge is properly spaced above the floor.

One object of the invention is to provide for suspending a sliding door, an improved translatable door support in which a novel and exceptionally compact adjustable construction, adapted to be housed in a very compact space above a suspended door and effectively concealed by the door, can be easily adjusted by a high leverage adjusting tool applied to concealed adjusting structure to progressively lift or lower a suspended door to any desired position of vertical adjustment.

A further object of the present invention is to provide a novel door hanger structure of the above described type which is of simple and rugged construction and which may be economically manufactured and readily applied to a door.

Other objects and advantages of the present invention will become apparent from the following description and the accompanying drawings wherein:

Fig. 1 is a fragmentary elevational view showing a sliding door supported by hangers incorporating features of the present invention;

Fig. 2 is an enlarged fragmentary cross sectional view taken generally along line 2—2 in Fig. 1;

Fig. 3 is a fragmentary cross sectional view taken generally along line 3—3 in Fig. 2;

Fig. 4 is a sectional view taken along line 4—4 in Fig. 2; and

Fig. 5 is a perspective view showing a portion of a hanger structure incorporating features of the present invention.

Referring now more specifically to the drawings wherein like parts are designated by the same numerals throughout the various figures, a sliding door 20 is supported by a pair of hanger structures 22 incorporating features of this invention for movement along a track 24 mounted within a header member 26 formed by a downwardly open, generally square channel having a width which is only slightly greater than that of the door 20. The track 24 depends into the center of the channel from the medial wall of the channel to which the track is attached as shown. As will be understood, the door may be shifted to and from the position shown in Fig. 1 and a door receiving pocket 28 constructed in a known manner within the wall 30.

The hanger structure 22 comprises a carriage assembly 32 adapted to be associated with the track member 24 and a bracket assembly 34 adapted to be secured to the door and also adjustably connected with the carriage assembly in the manner described fully below. The carriage assembly 32 has an elongated and generally vertically disposed body member 36. Stub shafts 38 and 40 are connected with opposite ends of the body member 36 respectively for rotatably supporting rollers 42 and 44. These rollers are adapted to ride on an upwardly facing surface of the track member 24. The lower edge of the body member 36 is integral with a generally horizontally extending lower marginal flange 46 closely underlying the track 24. The body member 36 and flange 46 together form a carriage frame member having a generally L-shape in transverse section. The flange 46 terminates in an upturned portion 48 which combines with the upstanding body member 36 for partially embracing the track. A screw 50 is adjustably threaded through a tapped aperture in the flange portion 48. In the position shown in Fig. 2, this screw will prevent the carriage assembly from being lifted sufficiently to disengage the rollers from the track. As will be understood however the screw 50 may be loosened or withdrawn sufficiently to permit intentional assembly or disassembly of the carriage and the track member.

The bracket assembly 34 comprises a bracket member having an L-shape in transverse section and including an upstanding section 52 slidably engaging the carriage frame plate 36 and a lower marginal horizontally extending flange 54 which is provided with a plurality of apertures so that it is adapted to be secured directly to the upper edge of the door by means of a plurality of screws 56. A central aperture 58 is provided in the flange portion 54 for rotatably receiving a body portion 60 of an internally threaded nut member. A flange 62 is provided on the nut body for engaging beneath the flange portion 54 of the bracket, and a gear element 64 is secured to an upper end portion of the nut body 60 and overlies the bracket portion 54. Thus the nut body 60 is rotatably mounted in the bracket portion 54 and is retained against axial movement in opposite directions with respect to the bracket portion 54 by the flange 62 and the gear element 64. A stud member 66 is threadedly received by the nut body 60 and depends from and is fixed to the flange portion 46 of the carriage body member 36. Thus the nut body and the stud or screw member serve to connect the bracket assembly with the carriage assembly.

In order to accomplish vertical adjustment of the door 20, the hanger structure 22 is provided with means selectively for raising or lowering the bracket assembly 34 with respect to the carriage assembly. This means comprises the above mentioned nut body 60 and screw member or stud 66 and the structure for rotating the nut body so that it will move either upwardly or downwardly along the stud to accomplish upward or downward adjustment of the door. The structure for rotating the nut body includes the above mentioned gear element 64 which is secured to the nut body. Another gear element 68 is mounted for rotation about a horizontal axis and meshes with the gear element 64. The gear element 68 is fixed to a shaft 70 which has a reduced diameter inner end portion 72 rotatably supported in a suitable aperture in the upstanding bracket portion 52. A cage or strap element 72 is secured to the upstanding bracket portion 52 by a plurality of rivets 74 or the like and extends over the gear element 68 for retaining the gear element and the shaft 70 in assembled relationship with the bracket portion 52. The strap member 72 is provided with a central aperture through which the shaft 70 extends and it is to be noted that an outer end portion 76 of this shaft is provided with a hexagonal or other non-circular peripheral configuration so that it may be readily engaged by a suitable wrench or tool as indicated by the tool 78 shown in broken lines in Fig. 2. It will be appreciated that the portion 76 may be readily turned in either direction with the aid of the tool 78 so that the gear element 68 serves

to drive the gear element 64 and thus rotate the nut body to accomplish the desired vertical adjustment of the door.

The hanger structure is provided with means for interconnecting the carriage body portion 36 and the upstanding bracket portion 52 in a manner which permits vertical relative adjustment of these parts but at the same time prevents lateral displacement of these parts and thus prevents possible application of undue lateral or bending stresses to the depending stud or screw member 66. More specifically, the carriage body portion 36 is provided with a pair of vertically elongated slots 80 and 82. A pin 84 extends through the slot 80 and has an end portion 86 upset so that it is secured to the upstanding bracket portion 52. The pin 84 is provided with an enlarged head 88 at its free end so that lateral separation of the carriage and bracket members is prevented. A similar pin 90 is secured to the upstanding bracket portion 52 and extends through the slot 82. This pin which also includes an enlarged head 92 cooperates with the pin 84 in preventing lateral separation of the carriage and bracket members and also cooperates with the pin 84 in preventing tilting of the bracket with respect to the carriage member.

While the preferred embodiment of the present invention has been shown and described herein, it is obvious that many structural details may be changed without departing from the spirit and scope of the appended claims.

The invention is claimed as follows:

1. A sliding door hanger comprising, in combination, a downwardly open horizontal channel which is substantially square in transverse section, a horizontal support track supported on said channel and depending into the central portion thereof, a carriage frame generally L-shaped in transverse section and having a vertical portion thereof vertically overlapping said track, carriage wheels journaled on said vertical frame portion and supported on said track, said carriage frame including a horizontal portion closely underlying said track and supporting an adjustable stop member in opposing relation to said track for engagement with the latter to prevent dislodgement of said wheels from the track, a threaded support element depending from said horizontal frame portion and being threaded up to said frame, a door support bracket generally L-shaped in transverse section and including a generally flat vertical portion overlapping said vertical carriage frame portion and including a horizontal flange underlying said horizontal carriage frame portion and adapted to fit directly against the upper edge of a door, a nut member rotatably mounted in said bracket flange and threadedly receiving said depending door support element, coacting guide means on said vertical portions of said carriage frame and said bracket guiding the latter for vertical movement with respect to the carriage frame, a first adjusting gear connected to said nut member in overlying relation to said bracket flange and extending through said vertical portion of said bracket, a second adjusting gear journaled on said vertical portion of said bracket and meshing with said first gear, and a stub shaft connected nonrotatably to said second gear and projecting horizontally therefrom within said channel for engagement by an adjusting tool.

2. A sliding door hanger comprising, in combination, a narrow downwardly open horizontal channel, a horizontal track supported within said channel, a carriage frame having a vertical portion vertically overlapping said track, carriage wheels journaled on said frame vertical portion and supported on said track, said carriage frame including a horizontal portion closely underlying said track, a threaded support element depending from said horizontal frame portion, a door support bracket including a generally flat vertical portion overlapping said vertical carriage frame portion and including a horizontal flange underlying said track and adapted to fit against the upper edge of a door, a nut member rotatably mounted on said bracket flange and threadedly receiving said depending door support element, coacting guide means on said vertical portions of said carriage frame and bracket guiding the latter for vertical movement with respect to the carriage frame, a first adjusting gear connected to said nut member in overlying relation to said bracket flange, a second adjusting gear journaled on said vertical portion of said bracket and meshing with said first gear, and a gear rotating element nonrotatably connected with said second gear and adapted for engagement by an adjusting tool.

3. A sliding door hanger comprising, in combination, a door support track adapted to be mounted in a horizontal position, a carriage frame having a vertical portion thereof vertically overlapping said track, carriage wheels journaled on said vertical frame portion and supported on said track, said carriage frame including a horizontal portion closely underlying said track, a threaded door support element depending from said horizontal frame portion, a door support bracket including a vertical portion slidably overlapping said vertical carriage frame portion and including a horizontal flange underlying said track and adapted to fit against the upper edge of a door, an adjusting nut member rotatably mounted on said bracket flange and threadedly receiving said depending door support element, coacting guide means on said carriage frame and said bracket guiding the latter for vertical movement with respect to the carriage frame, a first adjusting gear connected to said nut member in overlying relation to said bracket flange, a second adjusting gear, a gear rotating and support element adapted to be engaged by a rotating tool and nonrotatably connected to said second gear, and means journaling said gear support element on said vertical portion of said bracket to support said second gear in meshing relation to said first gear.

References Cited in the file of this patent

UNITED STATES PATENTS

766,578	Axman et al.	Aug. 2, 1904
844,468	Prouty	Feb. 19, 1907
890,950	Washburn	June 16, 1908
1,017,757	Hoffman	Feb. 20, 1912