Aug. 31, 1965 T. OHMAN 3,203,027

SLIDING DOOR SUPPORT

Filed July 2, 1962

Fig. 1.

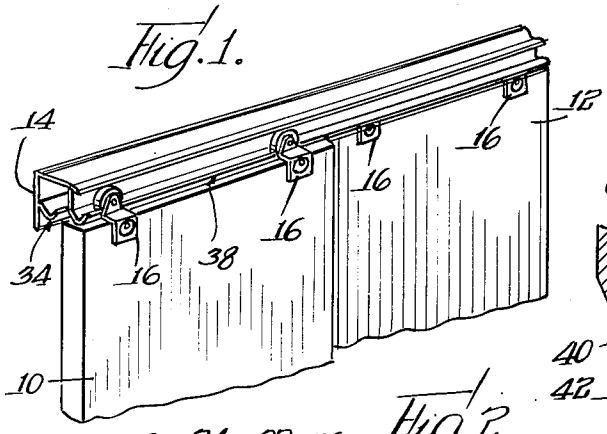


Fig. 2.

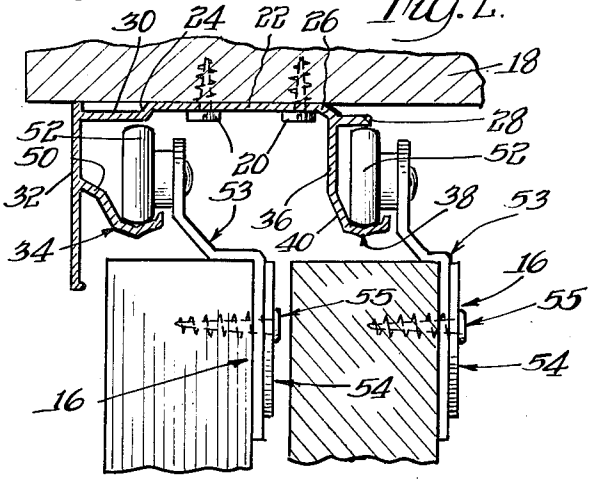


Fig. 4.

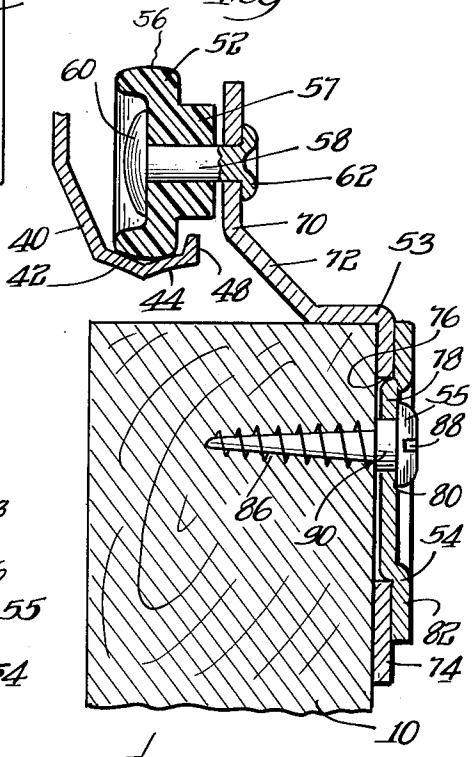


Fig. 3

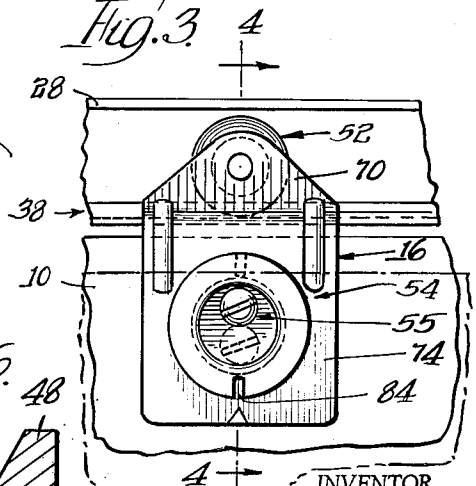


Fig. 5.

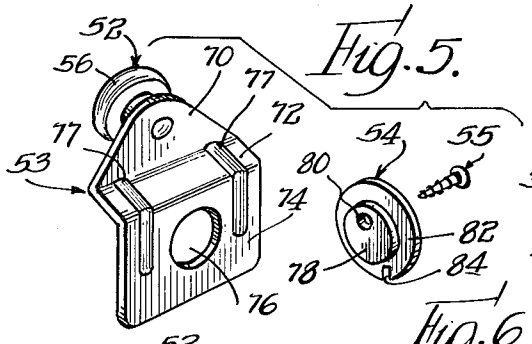
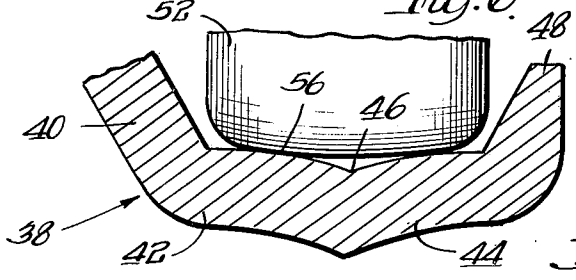


Fig. 6.



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SLIDING DOOR SUPPORT

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4 Claims. (Cl. 16—105)

This invention relates to a sliding door support and more particularly to an improved combination of a track for holding up a door and a hanger for attaching a door panel to a track as well as improved construction for a track and the door hanger.

The use of rollably supported doors or sliding doors as they are popularly called has become increasingly popular inasmuch as these doors provide an efficient use of space. Although the hardware for these doors has been steadily improved, several problems still persist. One of these problems is that a door panel tends to sway as it is moved from one position to another. Another problem is that, when the door panels are hung, each door panel must have its plumb adjusted. Many and varied devices are provided to prevent sway of a door panel and to adjust the plumb. The principal objection to all of these devices is that they are either expensive to manufacture or expensive to install, in that they require a substantial amount of labor, or both. It is, therefore, the principal object of this invention to provide an improved sliding door support which is economical to manufacture and simple to install.

It is another object of the instant invention to provide an improved track and hanger construction which provides a fixed path for movement of the door panel along a track to eliminate swaying of the door panel.

It is a further object of the herein disclosed invention to provide an improved door hanger which may be simply installed and the plumb of a sliding door panel may be simply adjusted.

It is a still further object of the present invention to provide an improved and simplified construction of a door hanger in which a single fastener accomplishes the dual function of supporting the door and providing means to adjust the plumb of the door.

Other objects and uses of the present invention will become readily apparent to those skilled in the art upon a perusal of the following specification in light of the accompanying drawing in which:

FIGURE 1 is a perspective view of a sliding door hung on a door support embodying the hereindisclosed invention;

FIGURE 2 is an end view of the door shown in FIGURE 1 but shown connected to a conventional door header;

FIGURE 3 is an enlarged side elevation of one of the door hangers of FIGURE 1 showing the details of construction thereof and a second position of the hanger shown in dotted form;

FIGURE 4 is a cross-sectional view taken on line 4—4 of FIGURE 3;

FIGURE 5 is an exploded view of the door hanger shown in FIGURES 3 and 4; and

FIGURE 6 is an enlarged cross-sectional view of a portion of a track shown in FIGURE 1 showing the engagement of a wheel of a hanger.

Referring now to the drawing and especially to FIGURE 1, it may be seen that a pair of door panels **10** and **12** are rollably supported on a track **14** by a plurality of identical door hangers **16**. The track **14** is secured to a conventional door header **18** by a plurality of screws **20** as may be seen in FIGURE 2.

Considering now the specific construction of the track **14**, in this instance, the track is an integral piece of extruded aluminum. The track includes a support plate **22** which receives the above-mentioned screws **20** to secure the track to the header **18**. Formed integral with the support plate is a front offset **24** and a rear offset **26**. The rear offset has a rear head stop **28** fomed integral therewith while the front offset has a front head stop **30** formed integral with it. The front head stop **30** has a trim strip **32** formed integral therewith which trim strip also acts as a spacer for a runner **34**. The rear offset **26** has a spacer **36** formed integral therewith and the spacer has a runner **38** formed integral therewith. The construction of runner **38** is identical with the construction of runner **34**.

Looking now to FIGURE 6 which shows an enlarged view of the runner construction, it may be seen that the runner **38** includes an elongated runner offset **40** which extends downward and away from the trim strip **32**. Formed integral with the runner offset is an elongated front convex section **42** which has a rear elongated convex section **44** formed integral therewith to provide a groove **46** between the two sections. A stop rail **48** is formed integral with the rear convex section **44**.

The construction of the runner **34** is identical to the runner **38**. However, the runner offset of runner **34** is secured to the trim **32** by a trim spacer **50**. It is readily apparent that, inasmuch as the track **14** is made of an extruded piece of aluminum, all of the parts are elongated and are formed integral with each other and extend over the entire length of the track.

As may be seen in FIGURE 2, the hangers **16** are rollably mounted in the runners to rollably support the doors. Since the construction of the hangers **16** is identical to each other only one of the hangers will be described in detail. The hanger **16** includes a wheel or roller **52** which rolls in its respective runner, a plate **53** rotatably supporting the wheel, a disc **54** which engages the plate, and a screw fastener **55** which secures the other parts to a door panel. Looking to FIGURE 6 it may be seen that the roller has a convex outer periphery or crown surface **56** which engages the convex sections **42** and **44** at substantially a point contact. The roller **52** has a shank **57** which provides a spacer for the wheel. The wheel is pivotedly mounted on a shaft **58** which in this instance is a rivet having a head **60** and a flaired end **62**. The rivet is fixed to the plate **53**.

The plate **53** includes a wheel support **70** which receives the rivet **58** and is engaged by the flaired head **62**. A plate offset **72** is formed integral with the wheel support in order to position the center of the crown of the wheel above the center of the door. The plate offset has a mounting plate **74** formed integral therewith and the mounting plate contains a circular aperture **76** which receives the disc **54**. Looking to FIGURE 5, it may be seen that the plate **53** has a pair of elongated bosses **77** formed in it to increase the strength of the plate.

As may be clearly seen in FIGURE 4, the disc **54** contains a circular recess plate **78** having a screw aperture **80** extending therethrough, which aperture is positioned closer to the outer periphery of the recess plate than to the center thereof. Formed integral with the outer periphery of the recess plate is a flange **82** which engages the mounting plate **64**. It should be noted that the distance between a plane determined by the outermost portion of the recess plate **78** and the innermost portion of flange **82** is less than the thickness of the mounting plate **74** for reasons which will become apparent hereinafter. The flange **82** contains a slot **84** to provide a convenient means for engaging the flange to rotate the disc.

The disc, as was mentioned above, is fixed to the door by fastener **55**. The fastener **55** is substantially conventional in construction in that it includes a threaded portion **86** and a slotted head **88**. Between the threaded portion **86** and the slotted head **88** is a shank **90** which fits into the screw aperture **80** so that the shank **90** acts as a bearing for the disc as will be described hereinafter.

The hanger **16** is applied to a door by positioning the hanger adjacent to one upper corner of the door with the door in its approximate plumb and preferably slightly below the anticipated level of the door. The screw **55** is fixed to the door with the plate **53** and disc **54** in position and, of course, wheel **52** is rotatably mounted on the plate. The door is hung by placing the door at a slight angle and positioning the lowermost portion of the wheel over the stop rail and then tilting the wheel into position to pass under the head stop.

After the door is hung onto the runner, adjustment of the plumb is then considered. If it is desired to lower slightly one corner of the door, it is necessary only to loosen the fastener **55** slightly, insert a screw driver or other similar device in the slot **84** to rotate the disc about the screw and within the aperture **76**. It may be noted that the screw aperture **80** is closer to the flange **82** than it is to the center of the circular plate **78**. Thus, the screw aperture is offset and, as the disc is rotated, the plate **53** is moved upward relative to the door, therefore, lowering the door relative to the runner. With the door at its proper level, the screw **55** is tightened so that the flange **82** frictionally engages the mounting plate **74** and holds the mounting plate tightly between the door and the flange. The friction between the flange and the mounting plate prevents rotation of the disc so that the door is held securely in position.

It should be noted that there is no need for high polishing of the disc and mounting plate so that the mounting plate and disc may be simple stampings. It should further be noted that the rougher the surfaces of the disc and the mounting plate the better the frictional contact and thus the better the holding powers of the hanger. It is also apparent that this installation is simple, requiring only one fastener and one tightening to secure the hanger to the door and to make an adjustment.

In the operation of the door it is readily apparent how the track and hanger cooperate to move the door along a predetermined path. As was mentioned above, the runner has two convex surfaces having a groove therebetween. The outer periphery of the roller is also convex to provide a substantially point contact between the wheel and the two convex surfaces. Thus, it is readily apparent as the wheel rolls on the two convex surfaces, the wheel tends to straddle the groove between the convex surfaces to keep the wheel in a path determined by the two convex surfaces. There is no tendency for the door to wobble in a path. Even though there should be wear on the wheel or on the runner, the construction of the convex surfaces adapts for wear so that the two surfaces are always effective. Furthermore, the amount of wear is reduced, inasmuch as the only wear is always a result of rolling rather than sliding and there is no opportunity for sliding or rubbing of surfaces in the instant construction.

It is also readily apparent that in the event that there should be a severe jolt to the door, the stop rail would hold the wheel in position. Should the jolt tend to hit the door upward the head stop would prevent the wheel from leaving the runner.

Although the instant device has been shown with a single wheel on a hanger, it is readily apparent that a construction using a twin wheel on a hanger may be used. A twin wheel hanger would operate in substantially the same manner as the single wheel hanger. It is also apparent that though the track has been shown and described with a trim strip as being an integral part of the track, it is apparent that a trim strip need not be used in certain instances and is therefore not essential to the present invention.

Although a specific embodiment of the hereindisclosed invention has been shown and described in detail, it is readily apparent that those skilled in the art may make various and sundry modifications and changes without departing from the spirit and scope of the instant invention. It is to be expressly understood that the present invention is limited only by the appended claims.

What is claimed is:

1. A sliding door support comprising, in combination, a support plate for attachment to a door header, a substantially vertical spacer fixed to said support plate, a runner offset fixed to said vertical spacer, a first elongated convex section fixed to said runner offset, a second elongated convex section fixed to the first convex section to provide an elongated groove between said sections, an elongated rail fixed to the second convex section, a roller having a convex outer periphery rollably engaging the first and second convex sections to roll in a predetermined path above the groove, a shaft rotatably supporting the wheel, a plate fixed to said shaft, said plate having an aperture contained therein, a disc positioned adjacent to said aperture, said disc having a fastener aperture contained therein, a fastener positioned in said fastener aperture, and a door fixed to said fastener and said fastener holding the disc in frictional engagement with the plate to secure the plate to the door.

2. A sliding door support comprising, in combination, a support plate for attachment to a door header, a substantially vertical spacer formed integral with the support plate, a runner offset formed integral with the vertical spacer, an elongated first convex section formed integral with the runner offset, a second elongated convex section integral with the first convex section forming a groove between the two sections, a rail formed integral with the second convex section, a roller having a crowned outer periphery rollably engaging the first and second convex sections to roll in a predetermined path above the groove, a wheel support rotatably connected to the roller, a plate offset formed integral with the wheel support, a mounting plate formed integral with the plate offset, said mounting plate having a circular aperture contained therein, a circular recessed plate rotatably positioned in the circular aperture, a flange formed integral with the recessed plate, said recessed plate having an aperture contained therein positioned closer to the flange than to the center of the plate, a fastener positioned in the aperture of said plate for holding the plate adjacent to a door and securing the mounting plate between the door and the flange, whereby the door may be positioned vertically relative to the support plate by rotating the recessed plate in the mounting plate aperture.

3. A door hanger for a sliding door comprising; roller means for engaging a track for supoprting a door; a plate connected to said roller means; said plate including a roller support connected to said roller means, a plate offset formed integral with the roller support, and a mounting plate having a circular aperture contained therein formed integral with the plate offset; a disc engageable with said plate; said disc having a circular boss mateably positioned in the circular aperture and a flange being formed integral with the outer periphery of the boss and the distance from the plane of the outermost portion of the boss to the plane of the flange being less than the thickness of the mounting plate; said flange having a slot contained in its outer periphery; said boss having an aperture contained therein and said aperture being closer to the flange than to the center of the boss; and a screw fastener having a head and a threaded portion positioned in the aperture in said boss and being securable to the door; said screw fastener having a shank portion adjacent to the head engageable with the disc; whereby said door hanger is secured to a door by securing the screw fastener to the door and the roller means may be adjusted vertically relative to the door by rotating the disc in the circular aperture in the mounting plate.

4. A door support comprising, in combination, a support plate for attachment to a door header, a substantially vertical spacer fixed to the support plate, a runner offset fixed to the vertical spacer, an elongated first convex section fixed to the runner offset, a second elongated convex

section formed integral with the first elongated convex section forming a groove between the two convex sections, a rail formed integral with the second convex section, roller means having a convex outer periphery rollably engaging the first and second convex sections to roll in a predetermined path above the groove between the first and second convex sections, a roller support rotatably connected to said roller means, a plate offset formed integral with the roller support, a mounting plate having a circular aperture contained therein formed integral with the plate offset, a disc engageable with said plate, said disc having a circular plate mateably positioned in the circular aperture, a flange being formed integral with the outer periphery of the circular plate and the distance from the plane of the outermost portion of the circular plate to the plane of the flange being less than the thickness of the mounting plate, said circular plate having an aperture contained therein and said aperture being closer to the flange than to the center of the plate, and a screw fastener having a head and a threaded portion positioned in the aperture in said boss and being securable to a door, said screw fastener having a shank portion adjacent to its head engageable with the disc, whereby a door secured to said screw fastener is vertically

adjustable relative to the support plate by rotating the disc relative to the plate.

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