July 7, 1959 C. N. ODEN 2,893,071

SLIDING DOOR ASSEMBLY

Filed Oct. 14, 1957 2 Sheets-Sheet 1

FIG. 1

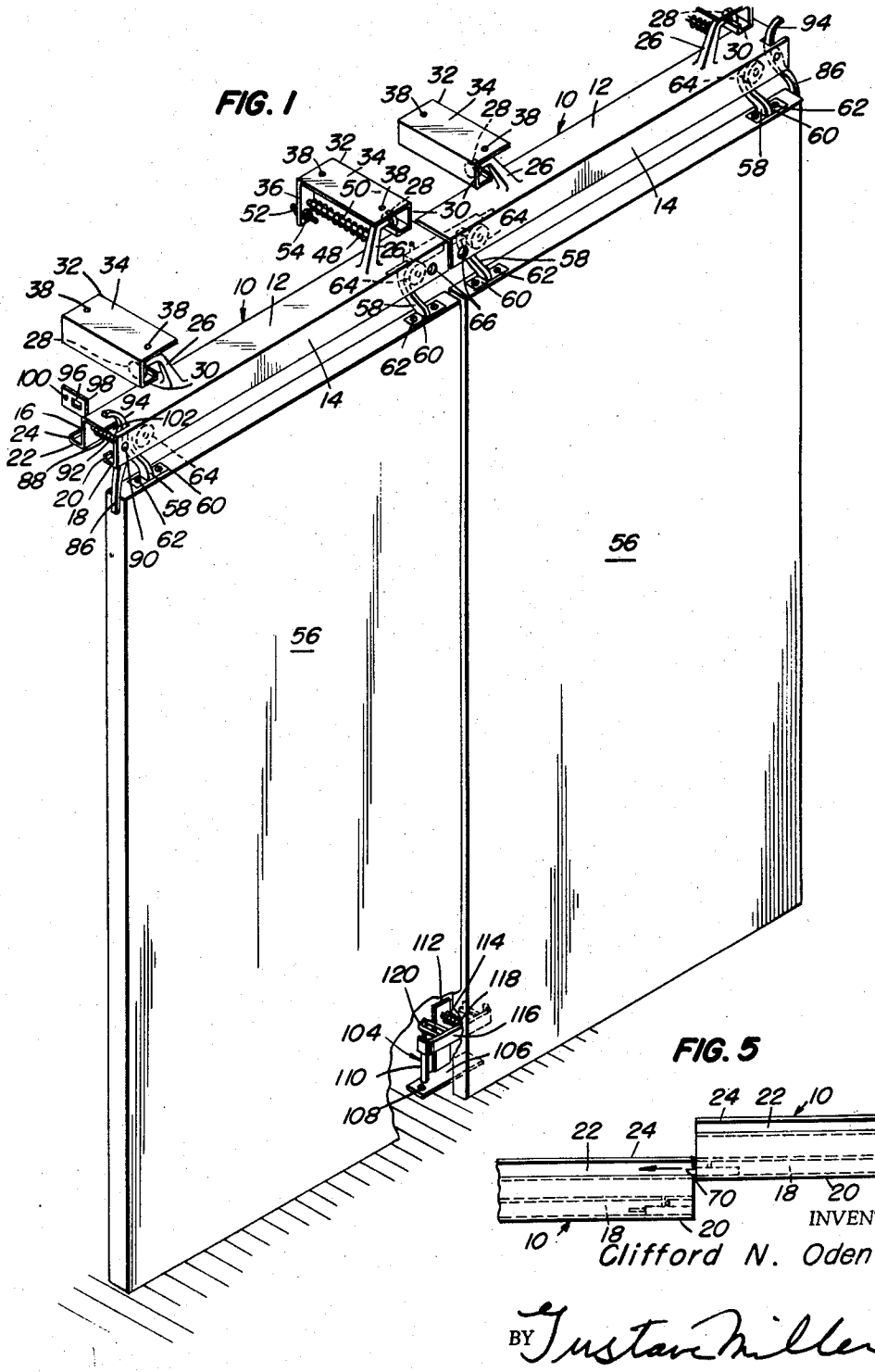



FIG. 5




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FIG. 2

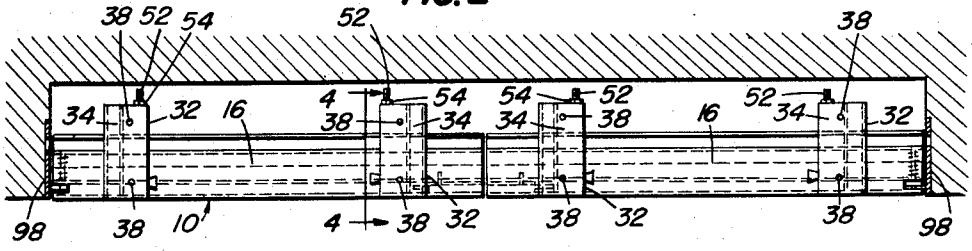



FIG. 3

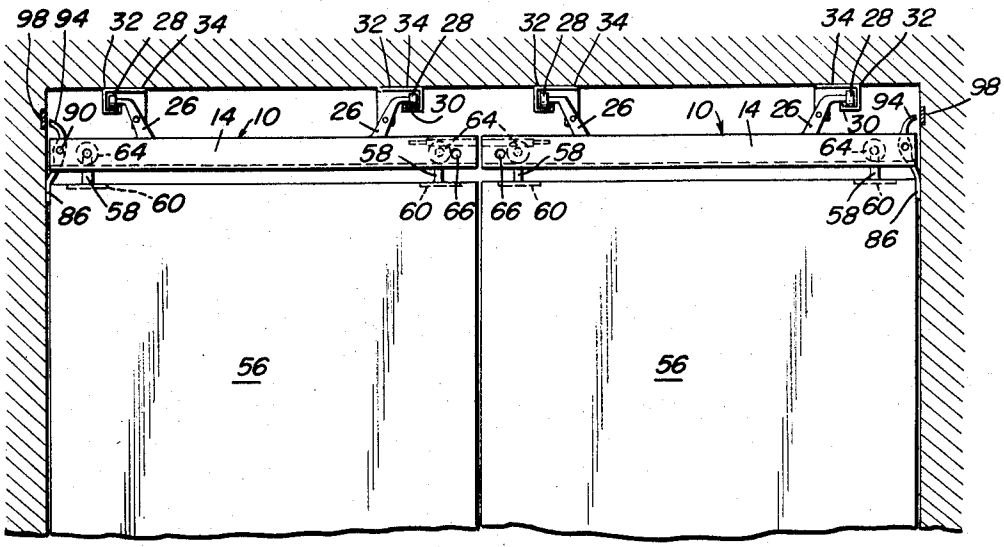



FIG. 4

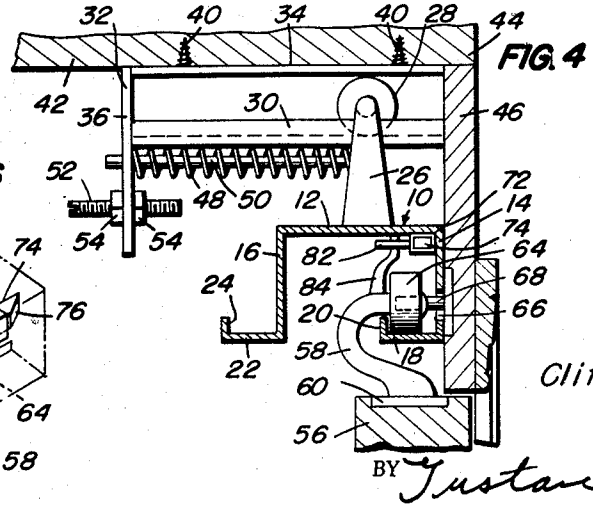
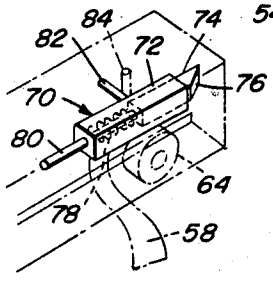



FIG. 6




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2,893,071

Patented July 7, 1959



2,893,071

# SLIDING DOOR ASSEMBLY

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Application October 14, 1957, Serial No. 689,883

5 Claims. (Cl. 20—19)

This invention relates to sliding doors, and it particularly relates to sliding doors which are in flush arrangement when closed.

Sliding doors or panels are coming into ever increasing use in modern housing because they do not require a clear area in front of the door to accommodate the swing-type door. For this reason they are becoming increasingly used for closets since they do not take up any useful room either within the closet or in the area in front of it. However, heretofore, most sliding door assemblies included two or more panels slidable on separate tracks, with the tracks offset from each other so that one panel can slide behind the other when opened. This type of arrangement, although generally favorable, necessitates a break or offset between each panel, when the doors are in closed position. This appearance would be greatly improved if the slidable panels could be positioned in edge-to-edge abutment in flush arrangement, when the doors are closed.

The above disadvantages have been long recognized but no adequate way has, heretofore, been found to provide the desired flush arrangement although many attempts have been made. Generally, however, these prior attempts have resulted in assemblies so complex and difficult to install and maintain that their commercial significance was nil. On the other hand, where the assemblies were attempted to be made simple, they did not function effectively and were easily broken or dislocated.

It is, therefore, one object of the present invention to provide a sliding door assembly which permits a flush arrangement of the door panels when in closed position.

Another object of the present invention is to provide a sliding door assembly which is relatively simple in construction and which is easy to install, maintain and use.

Other objects of the present invention are to provide an improved sliding door assembly, of the character described, that is easily and economically produced, which is sturdy in construction, and which is highly efficient in operation.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of a sliding door assembly embodying the present invention, the door panels being shown in closed position, and parts being broken away to disclose rearwardly-positioned elements.

Fig. 2 is a top plan view of the assembly of Fig. 1.

Fig. 3 is a fragmentary, front elevational view of the assembly of Fig. 1.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is a fragmentary, somewhat diagrammatic view showing the alignment of the tracks when the door is to be opened.

Fig. 6 is a detailed, perspective view of the latch mechanism.

Referring now in greater detail to the drawings where-



in similar reference characters refer to similar parts, there is shown a pair of track members **10** arranged in end-to-end alignment. Each track member **10** comprises an upper plate **12**, a front plate **14** and a rear plate **16**. The front plate **14** has a rearwardly-extending lateral flange **18** at its lower end and, at its free edge, the flange **18** has a low, upstanding rim **20**. The rear plate **16** is similarly provided with a rearwardly-extending lateral flange **22** at its lower end, and this flange **22** has a low rim **24** along its free edge. The flanges **18** and **22** with their corresponding rims **20** and **24** form guide channels as will hereinafter be more fully described.

The track members **10** are each supported by posts or hanger members **26** integrally connected to the top plates **12**. The posts or hangers **26** are each provided, at their upper ends, with rollers **28** which move in channels **30** provided on transverse track members **32**. These transverse track members **32** each comprise top plates **34** and rear plates **36**. The top plates **34** have holes **38** through which are adapted to extend wood screws **40** for connecting the transverse track members **32** to the top frame member **42** of a door frame **44**. The entire transverse track member **32** is positioned behind the front frame member **46** of the door frame **44**.

The posts **26** and rollers **28** attached thereto are resiliently biased forwardly toward the front frame member **46** by coil springs **48** positioned around pins **50**. Each pin **50** extends between a post **26** and the corresponding rear plate **36** and the spring **48** is compressed between the post and the rear plate, as best shown in Fig. 4.

In order to adjustably align the track members **10**, each plate **36** of each transverse track member **32** is provided with an opening at the lower end of one side. Through this opening extends an adjusting screw **52** with a pair of nuts **54** thereon, one nut being arranged on each side of the opening in the rear plate **36**. By adjusting the nuts **54** relative to the screw **52**, a bending torque is applied on the rear plate **36**, preferably constructed of sheet metal.

The track members **10** are also positioned behind the front frame member **46**, as best shown in Fig. 4, and each track member **10** supports a door panel **56** for movement relative thereto. Each door panel **56** is provided at its upper edge with a pair of brackets or hangers **58**, one adjacent each end. These brackets or hangers **58** are provided with base plates **60** positioned in recesses in the upper edge of the door panel and held therein by screws **62**. Each bracket **58** supports a roller **64** at its upper end, and these rollers **64** move within the front channels formed by the flanges **18** and rims **20** on the respective track members **10**.

Adjacent the inner end of each track member **10**, the front plate **14** is provided with a hole **66**. Through each of these holes **66** projects a stop pin **68** connected to the inner surface of the front frame member **46**. These door stop pins **68** limit the movement of the door panels **56** toward each other while the track members **10** are in end-to-end alignment. However, if one of the track members **10** is pushed back, against the force of the springs **48** so that the front channel portion thereof is in alignment with the rear channel portion of the other track member, as in Fig. 5, then the front plate **14** of the first track member is clear of the corresponding stop pin **68**, and the rollers **64** thereon are permitted to move onto the rear channel member of the other track member. The movement of such rollers from one track member to the other is indicated by the arrow in Fig. 5. In this manner, the door panels, which are flush with each other in closed position, are caused to open by having one move behind the other. This opening movement can, of course, be accomplished in either direction.

In order to maintain the offset positions of the two track members **10** (as in Fig. 5) while the opening movement takes place and while the doors are in open position, a latch mechanism **70** is provided. This latch mechanism **70**, one of which is provided on the front, inner end of each track member **10**, comprises a housing **72**, as best seen in Fig. 6, within which is slidably positioned a tongue member **74** having a beveled edge **76**. The front end of the housing **72** is open and the tongue member **74** is resiliently biased out of this open end by a coil spring **78** within the housing **72**. The spring **78** is wound around a rod **80** connected at one end to the inner end of the tongue member **74** and projecting out an opening in the rear end of the housing **72**.

A pin **82** is connected to the side of the tongue member **74** and extends laterally therefrom through a slot in the side of the housing **72**. This pin **82** is adapted to be contacted by an upstanding arm **84** on the inner bracket **58** on each door panel **56**. This arm **84** frictionally engages the pin **82** to hold the tongue member **74** in retracted position against the force of the spring **78**. However, when the door panel together with its corresponding track member **10** is pushed back so that the corresponding stop pin **68** is cleared, and the door panel is then moved over to the other track member **10**, the arm **84** is moved away from the pin **82** and the spring **78** acts to move the tongue member **74** outwardly and into the rear channel of the other track member, as shown in Fig. 5. In this position, the latch member **70** holds the two track members **10** against movement back to their normal end-to-end aligned position. When the doors are moved back to normal closed position, the arm **84** re-engages the pin **82** and forces the latch tongue member **74** back into its retracted position to permit closing of the doors.

In order to prevent the door panels **56** from rolling off the outer ends of the track members **10** when moved to closed position, a pair of limit stops are provided, one at the outer end of each track member **10**. These limit stops each comprises a catch finger **86** pivoted on a pin **88** one end of which is mounted in a hole **90** in the front plate **14** of the track member **10** and the other end of which is mounted in a similar hole in the rear plate **16**. A torsion spring **92** is positioned on the pin **88** and is connected to the finger **86** in such a manner as to bias the lower end of the finger against the outer edge of the door panel. The upper end of the finger **86** is provided with a hook portion **94** which is engaged with a slot **96** in a plate **98** when the finger **86** is in its normally biased position. The plate **98** has a hole **100** through which is adapted to extend a screw or the like for fastening the plate **98** to the door frame. A notch **102** is provided at the end of the upper plate **12** of the track member **10** to accommodate the finger hook portion **94** when the finger **86** itself is engaged by the door panel **56**. The end of the notch **102** also acts as a stop to engage the finger's hook portion **94** and prevent further outward movement of the door panel.

In order to prevent either door panel **56** from being pushed too far back when being opened, there is provided, behind the door panels, a bumper mechanism **104**. This bumper mechanism **104** is illustrated in Fig. 1 and comprises a base plate **106** secured to the floor by screws or the like **108**. Extending upwardly from the base plate **106** are a pair of oppositely-disposed posts **110** and a back plate **112** therebetween. Extending forwardly from the back plate **112** is a pin **114** having a bumper bar **116** on its front end. The pin **114** extends through an opening in the back plate **112** and is slidable therethrough. A coil spring **118** surrounds the pin **114** and abuts, at one end, against the bumper bar **116** and, at the other end, against the back plate



**112** whereby it acts to resiliently urge the bumper bar **116** forwardly against the door panels. On either side of the pin **114**, the bumper bar **116** is provided with eyelets **120** encircling the upper ends of the posts **110**, whereby the posts **110** support the bumper bar **116** at each end for forward and rearward slidable movement. The bumper bar **116** spans the inner edge portions of both door panels equally.

Although this invention has been described in considerable detail, such description is intended as being illustrative, rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. In combination, a door frame having an upper frame member, side frame members and a front frame member, at least two elongated track members supported from the upper frame member by means of individual transverse track members, each transverse track member comprising a top plate secured to said upper frame member, and a track channel dependent from said top plate, each elongated track member having at least one hanger member extending upwardly therefrom, each hanger member having a roller movably positioned in the track channel of a corresponding transverse track member, spring means connected to said transverse track members and urging said elongated track members into a forward, flush, end-to-end alignment, each elongated track member having a front and rear track thereon, said front and rear tracks of each elongated track member being in end-to-end alignment with the corresponding front and rear tracks of the other elongated track member when said elongated track members are in said flush alignment and the front track of one elongated track member being in end-to-end alignment with the rear track of the other elongated track member when said one elongated track member is pushed back transversely into a predetermined rearward position, and a fixed stop means projecting from the front frame member into the path of the rollers on the front track of each elongated track member when said elongated track member is in its forward position, said elongated track member being clear of said stop means when in said predetermined rearward position, and a door panel supported by the rollers movable in the tracks of said elongated track members.

2. The combination of claim 1 wherein a resilient bumper means is positioned rearwardly of each door panel.

3. The combination of claim 1 wherein an adjusting screw means is provided on each elongated track member to adjust the relative alignment thereof.

4. The combination of claim 1 wherein a normally extended latch means is provided on the inner end of the front track of each elongated track member, said latch means being adapted to extend into an overlapping position relative to the other track member when said latch means is in its extended position, and trip means connected to each door panel, said trip means acting to retain said latch means in retracted position while the door panel is held on the corresponding elongated track member.

5. The combination of claim 1 wherein a catch finger is pivotally mounted at the outer end of each front track, said finger being resiliently urged around its pivot toward the outer edge of the corresponding door panel.

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