

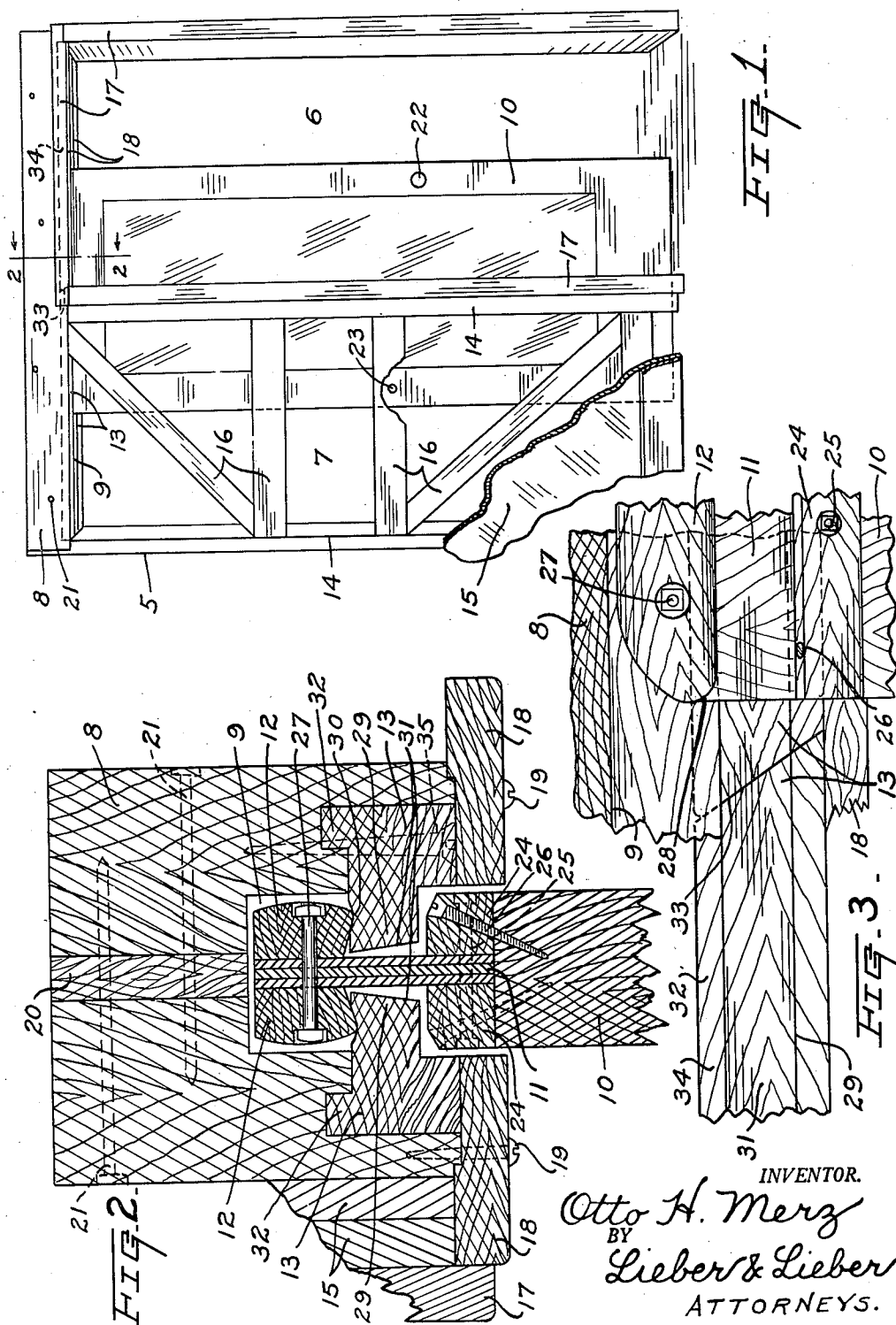
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SLIDING DOOR

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## SLIDING DOOR

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My present invention relates in general to improvements in sliding door assemblages, and relates more specifically to various improvements in the construction and operation of sliding door structures formed primarily of wood or other non-metallic materials.

The primary object of the present invention is to provide a new and useful sliding door unit which is simple and durable in construction and highly effective in use.

In the building industry, it has heretofore been desirable to provide sliding door units adapted to be bodily applied to certain walls of a building in relatively compact form and without necessarily increasing the wall thickness in order to accommodate the door. These door units ordinarily consisted of a door panel hung from an overhead track by means of several spaced rollers, and adapted to be slid into a central housing space provided in the wall adjoining the door opening. In some instances, the overhead guide tracks were formed directly on the wooden head jams or door headers, but the suspension rollers which coated with these tracks and the hangers which united the rollers with the door panel, were universally formed of metal such as die castings. The material from which these die castings were made has become difficult to obtain, and the same is true of the other hardware usually applied to such doors, and the use of the localized metal rollers on relatively heavy door panels was also quite objectionable because the weight of the door would cause the metal rollers to indent and rapidly wear the wooden guides. While some of these prior roller suspended sliding door assemblages were also provided with means for effecting removal or detachment of the door panel from the hangers and rollers, these prior detaching structures did not permit convenient removal of the rollers and tracks, and it is frequently desirable to effect removal of the hangers, rollers, and at least portions of the guideway, as well as of the door panels.

It is therefore a more specific object of the present invention to provide an improved sliding door unit which eliminates the use of metal except for the screws or nails required to maintain the structure properly assembled, and which can be produced from wood or similar relatively inexpensive and available materials.

Another specific object of my invention is to provide a durable wooden sliding door assemblage which is extremely compact and strong in construction, and which is easily manipulable and

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requires minimum attention after having been properly made and assembled.

A further specific object of this invention is to provide an improved hanger for sliding doors and an improved guide rail with which the door hanger is cooperable, both of which may be furnished as a compact unit for ready installation in a sliding door assemblage.

Still another specific object of the invention is to provide an improved sliding door suspension formed entirely of relatively durable and inexpensive materials, and which will permit ready removal of the door panel and at least portions of the suspension mechanism, and convenient re-installation thereof.

These and other objects and advantages of this invention will be apparent from the following detailed description.

A clear conception of the several features constituting the present improvement, and of the mode of constructing, installing and of manipulating sliding door units built in accordance with the invention, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a somewhat diagrammatic perspective view of a typical sliding door assemblage embodying my invention, the outer wall covering having been broken away in order to reveal normally concealed structure;

Fig. 2 is an enlarged transverse section through the improved door suspension, taken along the line 2—2 of Fig. 1; and

Fig. 3 is a similarly enlarged fragmentary and sectional view taken longitudinally through one of the suspension headers and looking toward the door suspension slides and guides.

While the invention has been shown and described herein as having been applied to a typical single panel sliding door and having all major parts thereof formed of wood, it is not my desire or intention to thereby unnecessarily restrict the utility of the improvement, and it is intended that the term "wood" as used herein, should include the various vegetable fibre plastic compositions being employed in the building industry as wood substitutes.

Referring to the drawing, the improved sliding door unit shown therein, comprises in general a frame 5 constituting part of a wall and having a door opening 6 and a normally concealed door housing space 7 adjoining one side of the opening 6; an elongated wooden header 8 spanning the

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tops of the opening 6 and space 7 and having a lower central recess 9 therein; a main door panel 10 slidable along and beneath the recess 9 from a position closing the opening 6 to a position of substantial concealment within said space; a door suspension plate 11 rigidly secured to the top of the panel 10 centrally thereof and extending upwardly and centrally within the recess 9; a pair of elongated slides 12 firmly secured to the opposite sides of the upper portion of the suspension plate 11 within the recess 9; and a pair of elongated T-shaped guides 13 secured to and extending throughout the length of the header 8 within the recess 9, and with which the adjacent slides 12 have substantially line sliding coaction whenever the door is opened or closed.

The frame 5 of the unit may be provided with upright studding 14 for firmly supporting the header 8, and to which plaster, wall board or other suitable outer covering 15 may be applied so as to enclose the space 7; and the frame 5 may also be rigidly interconnected by horizontal and diagonal braces 16 on the opposite sides of the space 7, see Fig. 1. The door opening 6 may be provided with ordinary casings 17 on the opposite sides of the frame 5, and with removable upper stops 18 located on opposite sides of and beneath the recess 9, the latter being detachably secured to the header 8 by means of screws 19, see Fig. 2. The elongated header 8 may be formed of several standard studs or wood beams, such as two-by-fours, separated by a spacer board 20, but firmly united by fasteners such as nails 21; and the recess 9 should be accurately formed and must be straight throughout its length. Suitable nail shields may also be provided on the opposite sides of the header 8, in order to prevent nails from entering the recess 9.

The main door panel 10 may be of any desired length, width and thickness, and may be provided with one or more decorative auxiliary panels, and with an actuating handle 22; and suitable guiding buttons 23 adapted to coact with adjacent braces 16 in order to maintain the lower portion of the main panel 10 centrally within the space 7, may also be provided, see Fig. 1. The door suspension plate 11 should be formed of durable plywood or the like, and should extend throughout the width of the main panel 10, and is rigidly secured to the top of the panel 10 by means of attaching strips 24 which are clamped to the plate 11 by transverse through bolts 25 and are firmly connected to the panel 10 by a series of inclined screws 26, as shown in Figs. 2 and 3. The elongated slides 12 are of similar rectilinear formation and are preferably constructed of hard and durable wood or other material having an oily texture, and these slides 12 are of the same length as the suspension plate 11 and are firmly clamped to the opposite sides of this plate by means of other bolts 27 as illustrated in Figs. 2 and 3. The front and rear ends of the laterally projecting or overhung slides 12 are preferably provided with chamfers 28 as indicated in Fig. 3, and the slides 12 have substantially straight line contact with the fixed guides 13.

The elongated T-shaped guides 13 with which the adjacent slides 12 coact to slidably support the door panel 10, are also of similar rectilinear formation, and each of these guides 13 is provided with a laterally projecting ledge 29 having a slight guide groove 30 in its top, and with an inclined surface 31 facing the suspension plate 11. The guides 13 are also provided with integral upwardly extending flanges 32 which are snugly

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fitted within grooves in the header 8 so as to prevent inward displacement of the guides; and each guide 13 is formed of aligned horizontal sections which coact along obliquely inclined end surfaces 33 as shown in Figs. 1 and 3. The guide sections 34 which span the door opening 6, are detachably secured to the adjacent header portion, by means of screws 35, and are additionally held in place by the upper stops 18 and screws 19 as depicted in Fig. 2; but the sections of the guides 13 which are above the space 7, may be permanently attached to the header 8 in any suitable manner. The door guides 13 may also be accurately constructed of durable hard wood or the like; and when the plates 18 and screws 35 are removed, the door panel 10 with its plate 11, slides 12 and strips 24 may be freely removed or applied through the door opening 6.

When the improved sliding door has been constructed and assembled as above described, the door panel 10 may be freely shifted from a position wherein it completely covers the opening 6 to a position wherein it is entirely confined within the space 7, by merely utilizing the handle 22 as an actuating medium. The slides 12 will obviously move freely along the slight grooves 30 of the guides 13 during such sliding movement of the door panel 10 and the guide buttons 23 will prevent the panel from swinging into contact with the internal structure of the frame 5. If it becomes desirable to remove the door panel 10, this may be readily accomplished by merely removing the screws 19 and the top plates 18, and by thereafter removing the screws 35 so as to release the guides 13. The door panel 10 may then be swung out of place through the opening 6, and the structure may be just as readily assembled by reversing these several operations. During sliding of the door panel 10, the chamfers 28 will cause the slides 12 to pass smoothly over the inclined joint surfaces 33, but these inclined surfaces 33 also facilitate maintenance of a smooth guide track when the structure has been assembled.

From the foregoing detailed description it will be apparent that my present invention provides an improved sliding door assemblage which is simple, compact and durable in construction, and which is moreover highly efficient in use. The sliding door assemblage can be made entirely of wood or similar non-metallic material, with ordinary woodworking machinery, and the fastenings for holding the assemblage together may be of ordinary and available construction. The improved sliding door structure requires no special lubrication or other attention, may be manufactured and installed at moderate cost, and presents an extremely neat appearance. The assemblage is also extremely strong and may be applied to walls or partitions of ordinary thickness, either singly or in double reversed units, and has proven highly satisfactory in actual operation. If so desired, vertical elongated adjustable stops similar to the ordinary window stops, may be applied to the side jamb of the door remote from the space 7 for receiving the edge of the panel 10 when closed. The specific formation of the elongated slides 12 and guides 13 reduces friction to a minimum, and insures smooth sliding of the door from the fixed guide sections to the removable guide sections, while still permitting convenient removal of the suspension mechanism and of the panel. The improved construction of the panel suspension mechanism also provides a continuous support above the door panel which

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precludes formation of local indentations or notches in the guides when the door is subjected to abuse such as when children ride the door, and the removable sections 34 of the guides also permit ready replacement of worn or defective parts of the hanger mechanism which are normally concealed and which might be subject to excessive wear due to such abuse. While the buttons 23 provide simple means for centralizing the door panel 10, these may obviously be replaced by a bottom guide secured to the lower end of the panel and projecting laterally therefrom.

It should be understood that it is not desired to limit this invention to the exact details of construction, or to the precise mode of operation, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. A sliding door hanger comprising, a horizontally elongated upright suspension plate extending substantially throughout the width of the door panel and being disposed centrally of the panel, attaching strips secured to the opposite sides of the lower plate portion for effecting attachment thereof to the door panel, horizontally elongated slides secured to the opposite sides of the upper plate portion and also extending substantially throughout the width of the door panel, and an elongated stationary guide projecting beneath each of said slides toward and in close proximity to the opposite sides of the medial portion of said plate, each of said guides having a slight guide groove extending throughout its length and each of said slides being provided with a longitudinal depending ridge having substantially line contact only with the adjacent guide groove.

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2. A sliding door hanger comprising, a horizontally elongated upright suspension plate extending substantially throughout the width of the door panel and being disposed centrally of the panel, means for effecting attachment of the lower portion of said plate to the door panel, horizontally elongated slides secured to the opposite sides of the upper plate portion and also extending substantially throughout the width of the door panel, and an elongated stationary wooden guide projecting beneath each of said slides toward and in close proximity to the opposite sides of the medial portion of said plate, each of said guides having a slight top groove extending throughout its length and each of said slides being provided with a longitudinal bottom ridge having substantially line contact only with the adjacent guide groove.

3. A sliding door hanger comprising, a horizontally elongated upright ply-wood suspension plate extending substantially throughout the width of the door panel and being disposed centrally of the panel, wooden attaching strips secured to the opposite sides of the lower plate portion for effecting attachment thereof to the door panel, horizontally elongated wooden slides secured to the opposite sides of the upper plate portion and also extending substantially throughout the width of the door panel, and an elongated stationary wooden guide projecting beneath each of said slides toward and in close proximity to the opposite sides of the medial portion of said plate, each of said guides having a slight guide groove extending throughout its length and each of said slides being provided with a longitudinal depending ridge having substantially line contact only with the adjacent guide groove.

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