

May 4, 1954

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2,677,154

SLIDING PANEL DOOR

Filed Nov. 5, 1948

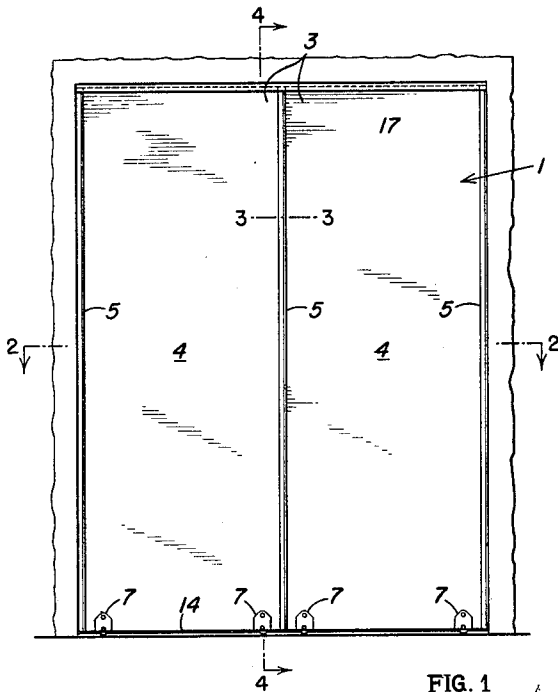
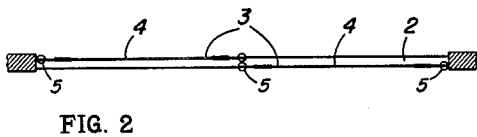
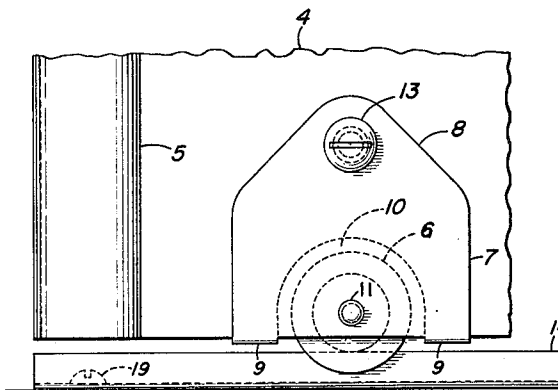


FIG. 3

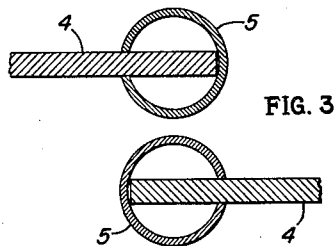


FIG. 4

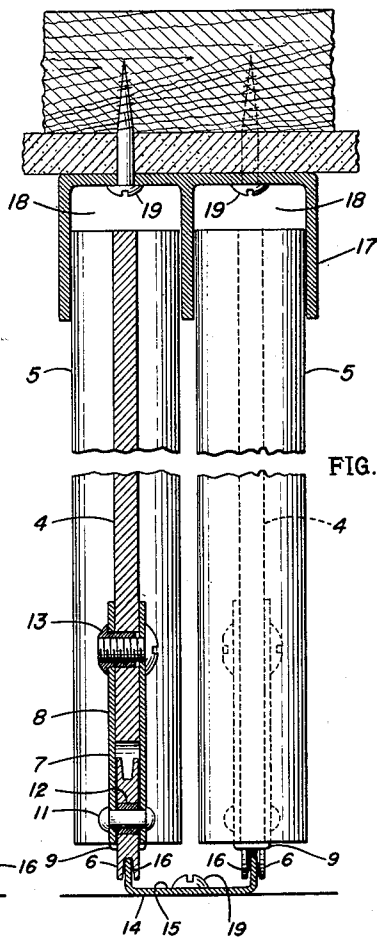


FIG. 5

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UNITED STATES PATENT OFFICE

2,677,154

SLIDING PANEL DOOR

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Application November 5, 1948, Serial No. 58,409

4 Claims. (Cl. 20—19)

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This invention relates to sliding panel doors and has for its primary object the provision of an improved sliding door unit which is adaptable for use in a space of any desired size and mountable therein without special preliminary preparation.

Another object of the invention is to provide improved sliding panel doors which may be either prefabricated or fitted on site with a minimum of effort and expense.

Another object of the invention is to provide sliding panel doors having improved hardware enabling the bodies of the doors to be constructed of exceptionally thin, inexpensive panels without sacrifice of strength or efficiency of operation.

Other objects and advantages of the invention will appear hereinafter in the detailed description, be particularly pointed out in the appended claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a front elevational view of a sliding door unit embodying the present invention.

Figure 2 is a horizontal sectional view taken along the lines 2—2 of Figure 1.

Figure 3 is a fragmentary horizontal sectional view on an enlarged scale taken along the lines 3—3 of Figure 1.

Figure 4 is a fragmentary vertical sectional view on an enlarged scale taken along the lines 4—4 of Figure 1; and

Figure 5 is a fragmentary front elevational view on an enlarged scale showing a door corner and associated structure.

It has long been known that sliding doors possess advantages in many applications over the traditional swinging door, the principal one being economy of space. Consequently, sliding doors have been widely used as closures for closets, display cases and the like. In such installations a plurality of doors are employed to enclose a space, the doors being mounted in overlapping relation such that by selective displacement of the individual doors all portions of the enclosed space can be made accessible. The main objection to the types of sliding doors heretofore employed has been that they require special frames or other special modification of the openings to be closed before the doors can be installed. As will hereafter become apparent, the sliding door unit of the present invention is adapted to close a space from floor to ceiling and wall to wall without preliminary preparation or restriction of the defining surfaces.

Referring now in detail to the drawings illustrating a preferred embodiment of the invention

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and in which like reference characters designate like parts, the improved sliding door unit, indicated generally as 1, has been illustrated applied as a closure for an opening 2, which may be defined merely by the ordinary ceiling, floor and side walls. The unit includes two or more doors 3, each occupying its proportionate share of the opening.

The doors 3 are particularly adapted to have their bodies 4 each made of a single sheet or panel of exceptionally thin material, $\frac{1}{4}$ " plywood or Masonite or other composition paneling being suitable for this purpose. Forming the vertical edges of each of the doors and extending the full height thereof are tubular edge members 5. These edge members are of relatively thin steel or like metal and are split or open-seamed from top to bottom. With its open seam each tube may be applied simply by spreading the seam sufficiently to accommodate, overlap or embrace an edge of a panel, the resiliency inherent in the metal tube thereafter enabling the tube to grip or embrace the panel and with sufficient force to hold it in place without use of nails or other connecting devices.

The door of the present invention is intended to be supported on rollers running on underlying tracks. For this purpose there is provided for each door a plurality of rollers or wheels 6, grooved to prevent displacement transversely relative to their track, two rollers being adequate for the light weight construction herein described. Each of the rollers is affixed, attached or secured to the associated door through a sheave, housing or bracket 7. The latter is designed to overlap the lower or bottom edge of the door and embrace opposite sides thereof through spaced side plates or braces 8 to which the roller is journaled. Also forming part of the sheave are bearing members or supports 9 disposed on either side of the roller, these bearing members or arms extending transversely of the door and underlying and abutting its bottom edge. While the side plates may be separate for application to panels of different thicknesses, the sheave is preferably integral or one piece for a given panel thickness, the bearing members in this case being spaced webs or links extending between and connecting the lower edges of the side plates.

To minimize clearance below the lower edge of the door, each of the rollers is preferably inset in a suitable recess 10 formed in the lower edge portion of the door such that a relatively small portion of the roller extends therebelow, the recess being closed at either side by making

the side plates, intermediate the bearing members, coterminous with the lower edge of the door. For the disclosed unitary construction of sheave, the associated roller may be journaled thereto through a rivet 11 or the like, a self-lubricating bearing 12 of "Oilite" or like type preferably being inserted between the roller and its shaft or axle to ensure free running of the former without further lubrication. For attaching, securing or connecting each of the sheaves 7 to a door panel, the side plates 8 may be joined above the roller by a suitable connection, such as the illustrated double headed clamping screw 13, extending below the plates through a suitable opening or passage in the panel. With the bearing members 9 supporting the weight of the door and transverse forces resulting from friction at a minimum, the connection 13 serves primarily to position the sheave on the panel and is subject to little, if any, stress, enabling a single connection to suffice.

For mounting the doors 1 in the opening 2 there is provided a floor or bottom guide member or support 14. This support has a flat floor or other surface-engaging portion 15 and a plurality of spaced upstanding or vertical, longitudinally extending ribs or flanges 16. The support, U-shaped for a pair of doors, extends across the opening and through its ribs provides spaced tracks, one for the wheels of each of the doors. The upper end or guide member of the unit is a multiple channeled overhead spacer or guideway 17 having a channel 18 overlying and aligned with each of the tracks and of sufficient width to slidably accommodate the tubular edge members. These channels are relatively deep, thus enabling them to engage and guide the doors, regardless of irregularities in the ceiling or other surface to which the guide member is applied. Both the support 14 and the guide member 17 may be attached or secured in place by any suitable means, such as the illustrated screws 19.

Of relatively simple configuration, both the support 14 and guide member 17 may be extruded or otherwise formed as continuous strips, as may the split tubular edge members 5. Consequently, these several parts may readily be cut to any desired length. The thin panels 4 being flat, may also be cut to any size required from standard material. Accordingly, the sliding door unit is particularly suited for prefabrication but may also be fitted and installed on site with a minimum of effort. While special preparation of the opening-defining surfaces is unnecessary, the unit may of course be mounted on a base above floor level or adapted to close any other space in which sliding doors are desired. Installed merely by screwing or otherwise attaching the support and guideway to the confronting faces of the opening, the unit thereafter provides smooth running doors which usurp a minimum of space and wherein the edge members serve both as reinforcements and as spacers to position the panels relative to their overhead guideways, the latter preventing any deformation of the panels from adversely affecting operation of the doors.

From the above detailed description it will be apparent that there has been provided an improved sliding door unit which is adapted to serve as a closure for any desired space and is of simple and inexpensive construction. It should be understood that the described and disclosed embodiment is merely exemplary of the in-

vention and that all modifications are intended to be included which do not depart either from the spirit of the invention or the scope of the appended claims.

Having described my invention, I claim:

1. A sliding door unit comprising a plurality of panels, reinforcing means consisting of split tubular edge members overlapping and resiliently clamping vertical edges of each of said panels, a plurality of sheaves overlapping and abutting the bottom edges of said panels intermediate said edge members, grooved rollers mounted in said sheaves, a support having a plurality of ribs each serving as a track for the rollers of one of said panels, and a multi-channeled overhead guide member having a channel overlying each of said ribs and slidably embracing the edge members of one said panels.

2. A sliding door unit comprising a plurality of panels, reinforcing means consisting of split tubular edge members overlapping and resiliently embracing vertical edges of each of said panels, a plurality of grooved rollers for each of said panels projecting below a bottom edge thereof intermediate said edge members, a sheave mounting each of said rollers, said sheave overlapping and having portions abutting said lower edge on either side of said roller, a support underlying and having upstanding ribs each serving as a track for the rollers of one of said panels, and a multi-channeled overhead guide member having a channel overlying each of said ribs and slidably embracing the edge members of one of said panels.

3. A sliding door unit comprising a plurality of panels, reinforcing means consisting of split tubular edge members overlapping and resiliently embracing vertical edges of each of said panels, grooved rollers for each of said panels and disposed intermediate said edge members, a sheave mounting each of said rollers, said sheave having plates abutting opposite sides of the associated panel and having portions extending transversely of and abutting the lower edge of said panel on either side of said roller, a support underlying and having upstanding ribs each serving as a track for the rollers of one of said panels, and a multi-channeled overhead guide member having a channel overlying each of said ribs and slidably embracing the edge members of one of said panels.

4. In a sliding door unit, the combination of a door panel, edge reinforcing means for said panel consisting of split tubular members substantially coextensive in height with and each overlapping and resiliently embracing a vertical edge of said panel, and a channel overlying said panel and slidably embracing said tubular members.

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