

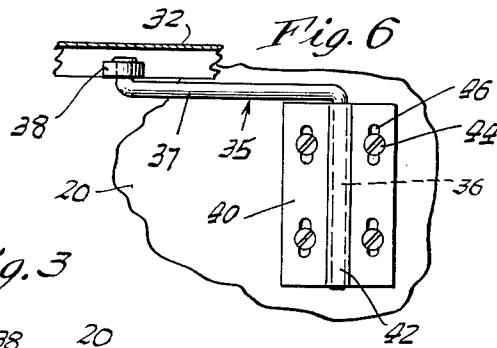
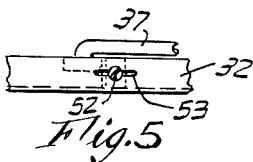
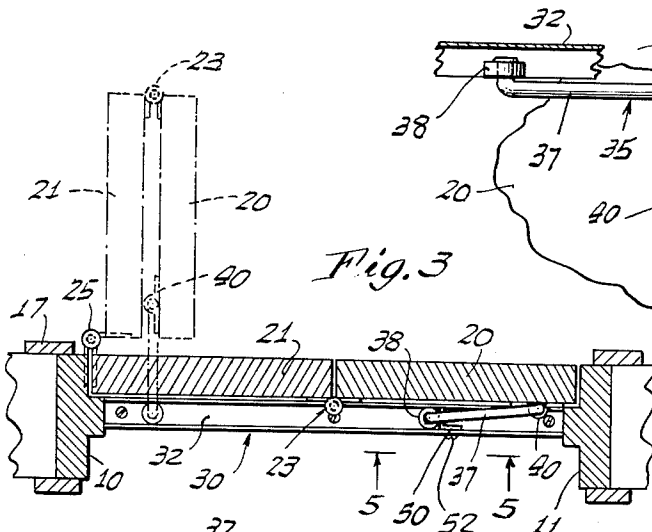
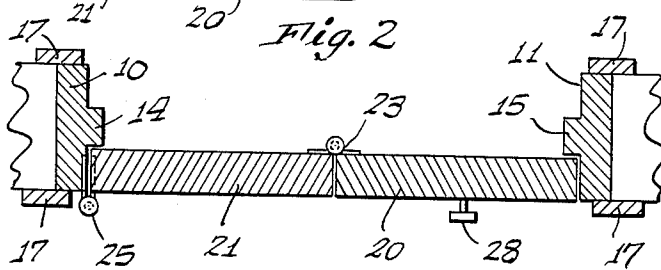
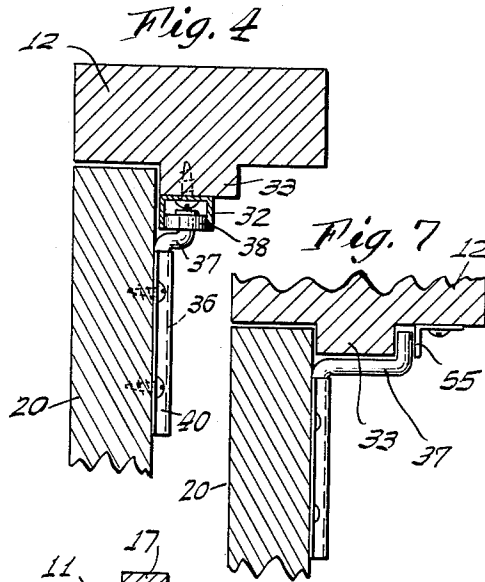
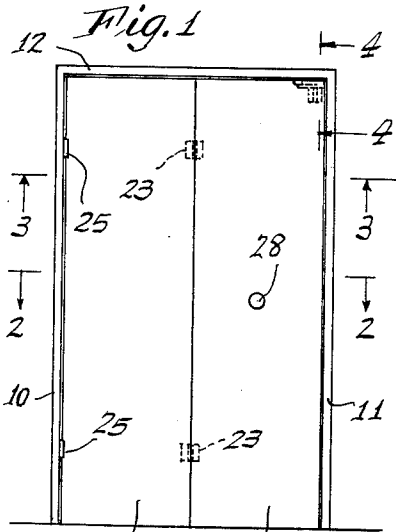
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COMBINATION FOLDING DOOR AND GUIDE MEANS THEREFOR

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COMBINATION FOLDING DOOR AND GUIDE MEANS THEREFOR

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1 Claim. (Cl. 160-206)

This invention relates generally to folding doors, and more particularly to the combination of a folding door and guide means operable to control the opening and closing movements of the door.

An object of the invention is to provide a novel and improved combination folding door and guide means therefor wherein a smooth and easy action of the door is effected, both during the opening and closing movements thereof.

Another object of the invention is to provide an improved combination folding door and guide means as above, wherein the door when in the folded or open position is disposed substantially wholly to one side of the doorway and at right angles to the plane of the opening thereof, and further is disposed wholly outside of the said opening.

An additional object of the invention is to provide an improved combination folding door and guide means as above characterized, which is rugged and reliable in operation while at the same time of extremely simple construction involving relatively few components, thereby to make possible not only an eminently satisfactory product but also a low fabrication or manufacturing cost.

Still another object of the invention is to provide an improved door and guide in accordance with the foregoing, wherein the guide portion is relatively small and compact, especially unobtrusive, and requires but little space at the door frame.

A feature of the invention resides in the provision of a novel folding door and guide means wherein swinging movements of the door panels are normally prevented by the guide means both for the fully opened and fully closed door positions.

Another feature of the invention resides in the provision of an improved door guide means and folding door combination as above, which while preventing swinging movement of the open or closed door panels at the same time enables the panels to be easily moved in the directions required for operating the doors.

Yet another feature of the invention resides in the provision of an improved combination folding door and guide means wherein an adjustable stop is provided in conjunction with the guide to prevent undesired shifting and opening movement of the closed door, the adjustability enabling small variations of dimensions to be taken care of during installation.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification similar characters of reference have been used to designate like components throughout the several views in which:

FIG. 1 is a front elevational view of a combination folding door and guide means therefor, as provided by the invention.

FIG. 2 is a horizontal section taken on the line 2—2 of FIG. 1.

FIG. 3 is a horizontal section taken on the line 3—3

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of FIG. 1, the open position of the door panel being indicated by dotted outlines.

FIG. 4 is a fragmentary vertical sectional view, taken on the line 4—4 of FIG. 1.

FIG. 5 is a fragmentary inside elevational view, looking in the direction of the arrows 5—5 of FIG. 3.

FIG. 6 is a detail showing a pivoted arm construction carried by one of the door panels of FIGS. 1-4.

FIG. 7 is a fragmentary vertical sectional view similar to that of FIG. 4 but showing a modification of the invention.

Referring first to FIGS. 1-4 there is illustrated a door frame comprising jambs or side frame members 10, 11 joined to the ends of a top frame member 12 in any suitable manner. As shown in FIGS. 2 and 3 the door jambs 10, 11 may have stop strips 14 and 15 respectively, arranged for engagement with the folding door panels. Suitable moldings 17 may be provided, to finish off the door frame as will be readily understood.

In accordance with the present invention there is provided a novel and improved combination folding door structure and guide means therefor having a number of desirable features and advantages. The combination door and guide means is extremely simple in its construction, and involves relatively few parts which may be economically fabricated and produced. Moreover, the construction is such that the folding door may be readily operated for either opening or closing the door panels, yet the panels when in opened and closed positions are restrained from having undesired swinging or shifting movement, being maintained respectively substantially perpendicular to the door opening or else completely spanning the said opening within the frame members 10, 11 and 12. Moreover, the opening and closing action of the door panels is smooth and easy, and the door operation may be readily accomplished by grasping a single door knob and applying suitably directed force thereto. Also, the door panels when opened provide the maximum degree of access to the space between the door frames, and occupy relatively little room. The guide means is compact, small and unobtrusive, being normally not readily noticed.

Accordingly, as seen in FIGS. 1-3, the invention provides a pair of door panels 20, 21, which are hingedly secured together as by suitable hinge fittings 23 of the butt type. The door panel 20, in accordance with the invention, is associated with a novel guide means, and the controlled action of such door panel is thus transmitted to the second door panel 21 which latter is hingedly secured to the jamb or frame member 10, as seen in FIGS. 1, 2 and 3.

In accordance with the invention, the second door panel 21 may be hingedly hung on the jamb 10 by the customary butt-type hinges, two such hinges being shown and indicated at 25. A characteristic of such hinges is that the axis is disposed adjacent an edge of the door jamb or frame member. For example, as seen in FIG. 2, the pivotal axes of the hinges 25 are disposed at a point outside of the frame member or jamb 10, such point being spaced a substantial distance from the center of the jamb and permitting the panel 21 when closed to occupy the space between the door stop 14 of the jamb and the pivot pins of the hinges 25. With such construction, as illustrated in FIG. 3, the door panel 21 when swung open

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at a right angle will be disposed entirely out of the space located between the two upright jambs 10, 11.

Also, in accordance with the invention, the door panels 20, 21 are preferably so pivotally connected by the hinges 23 that they may be swung back-to-back in closely juxtaposed open positions, as seen in FIG. 3 and indicated in dotted outline.

For such positions, and also for the fully closed positions shown in full lines, the improved guide means of the invention will exert a desirable control over the door panels and prevent undesired swinging movement of the same. As shown in FIGS. 2 and 3, the hinge means 23 permit the panels 20, 21 when in their closed positions to lie in a common plane. For actuating the doors, either to open or close them, any suitable type of door knob 28 may be provided on the door panel 20.

In accordance with the invention, in conjunction with the folding door panels 20, 21 there is provided a novel guide means by which there is not only effected a desirable control of the movements of the door but at the same time the operation of the door is made smooth and easy. The said guide means comprises an elongate track 30, which in the illustrated embodiment of the invention shown in FIGS. 1-6 comprises a channel-section metal strip 32, the said strip being secured to a door stop 33 on the upper frame member 12, as by the screws illustrated in FIG. 4. The guide channel 32 may extend between the door stops 14 and 15 of the jambs 10, 11 as seen in FIG. 3, and may be flush at one side with the door stop 33 of the upper frame member 12. Thus, the channel 32 also constitutes a stop means for the two door panels 20, 21.

Further, in accordance with the invention, the door panel 20 is provided with a novel pivoted-arm type of control, arranged to engage and slide along the track 30 comprising an angular piece of heavy wire 35, said wire having a bearing portion 36 and an arm portion 37 and the latter being provided with a slide member 38 which is spaced from the bearing portion 36 and is engageable with and shiftable along the track 30 within the space between the opposite sides of the channel 32. The slide member 38 may be advantageously constituted as a roller, as shown, to provide for easy sliding or rolling movement along the track member 32. Further, the pivoted-arm control comprises a pivot fitting 40 having an offset bearing portion 42 receiving and engaging the bearing portion 36 of the wire piece 35. The pivot fitting 40 is secured to the upper corner portion of the door panel 20 by suitable screws 44, and as provided by the invention has slots 45 through which the screws 44 pass, thereby to enable the pivot fitting 40 to be adjusted vertically during installation of the door and guide means.

By the provision of the novel pivotal-arm type control on the door panel 20 there is exercised a desirable control over the movement of the two-panel door.

Referring to FIG. 3 it will be seen that when the panels 20, 21 are in their extended positions closing or spanning the opening of the door frame, the pivot arm 37 will be disposed closely adjacent and virtually flat against the inside surface of the door panel 20. When the panels 20, 21 are operated in opening direction, the portions joined together by the hinges 23 will swing outward or upward as seen in FIG. 2 (downward as seen in FIG. 3), and the control arm 37 will gradually swing away from the panel 20 until, as shown by the dotted outlines in FIG. 3 the arm 37 lies virtually parallel to the two panels 20, 21 which are also substantially parallel to each other. When in the dotted line positions of FIG. 3 the panels 20, 21 will be prevented from swinging as a unit about the axes of the hinges 25 by virtue of the control arm 37 being restrained by the channel track 32.

In accordance with the invention a stop member 50 is adjustably positioned in the track 32, being secured therein by a screw 52 passing through a slot 53 provided

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in the channel. The stop 50 is adapted to engage the slide member 38 when the door panels 20, 21 are closed as shown in FIG. 3, and the presence of such stop prevents the panels from swinging outward as a unit (while aligned with each other in the same plane) about the pivotal axis provided by the hinge fittings 25. Thus, for the open and closed positions of the door panels the control arm 37 exerts a restraint on the panels, preventing undesired movement thereof. Yet, when the knob 28 is grasped and pulled or urged in the proper direction the panels 20, 21 may be readily opened or closed and the smooth and easy movement of such panels is assured by the guide 30 and control arm 35.

It will be noted that the door panel 21 functions as a hinged linkage means for mounting the first door panel 20 on the door frame member or jamb 10, such linkage means enabling the panel 20 to be moved close to and away from the frame member 10 and to be turned simultaneously with such movement.

A modification of the invention is illustrated in FIG. 7, wherein the channel-section track 32 is replaced by an angle-section strip 55 which acts in conjunction with the door stop 33 of the upper frame member 12 to form a track for the control arm 37. Also, as seen in FIG. 7, the roller 38 may be dispensed with and instead the upturned end of the arm 37 may constitute the slide member which moves along the track formed between the stop 33 and the angle member 55.

It will now be understood from the foregoing description that I have provided a novel and improved combination folding door and guide means which restrains latter undesired movement of the door panels while at the same time enabling the same to be easily and smoothly shifted between their open and closed positions. The components involved are seen to be simple in construction, and may be economically fabricated. Moreover, the installation of the door panels and guide means may be easily and quickly effected.

Variations and modifications may be made within the scope of the claim and portions of the improvement may be used without others.

I claim:

In combination:

- (a) a door frame including a pair of vertically disposed spaced frame members,
- (b) a horizontally disposed frame member connected to the top and extending between said vertical frame members to define an opening,
- (c) a stop strip connected to each of said frame members for extending about said opening,
- (d) a plurality of folding door panels including a first panel and a second panel for spanning said opening,
- (e) means for hingedly connecting each of said door panels in abutting end to end relationship,
- (f) a butt type hinge for connecting said first door panel to one of said frame members,
- (g) said butt type hinge having a pivot pin spaced from the stop strip of adjacent vertical frame member outwardly of said opening so that in the closed position said first door panel occupies the space between the stop strip and said hinge pin,
- (h) means forming a downwardly open track connected to and extended along said top frame member between said pair of spaced vertical frame members,
- (i) a control arm having an intermediate horizontally disposed leg portion, a depending leg portion connected to one end of said horizontal leg portion, and an upright leg portion connected to the other end of said horizontal leg portion,
- (j) means for pivotally mounting the depending leg portion of said control arm to said second door panel, said means including a fitting having an offset bearing portion for receiving said depending leg portion, and means for rendering said fitting vertically adjustable,

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(k) said upright leg portion being disposed so as to be received in and movable along said track, a roller rotatably journaled on said upright leg portion, said roller being in engagement with said track, said control arm and roller connected thereto being disposed closely adjacent and substantially parallel the connected door panel in the closed position thereof, **5**

(l) and rigid stop means including an abutment fixed in said track so as to render said abutment immovable relative to said track and arranged to engage said control arm within said track to prohibit the connected panels from swinging outwardly as a unit when said panels are substantially aligned in the same **10**

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plane in the closed position and whereby only the initial closing force is required to align said panels in the same plane to insure closing of said opening.

References Cited in the file of this patent

UNITED STATES PATENTS

527,470	Wilbor	Oct. 16, 1894
1,499,312	Ferris	June 24, 1924
1,581,854	May	Apr. 20, 1926
2,333,312	Grinstead	Nov. 2, 1943
2,882,962	Hollansworth	Apr. 21, 1959
2,943,675	Ford	July 5, 1960