March 10, 1953 L. JOYCE 2,630,606

HOLLOW DOOR CONSTRUCTION

Filed Jan. 31, 1952

FIG. 1.

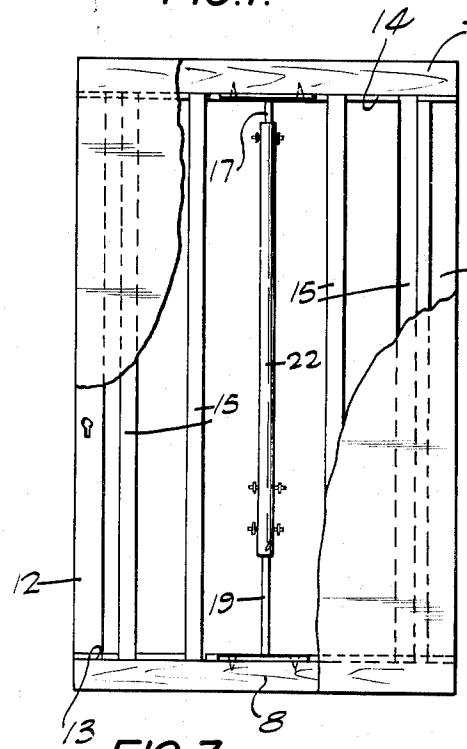


FIG. 2.

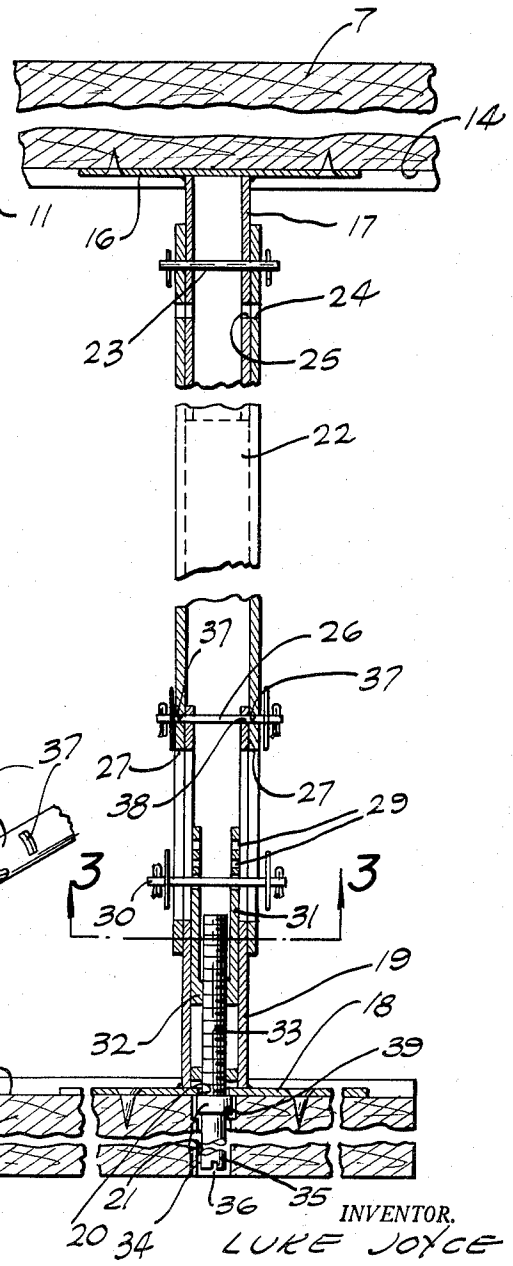


FIG. 3.

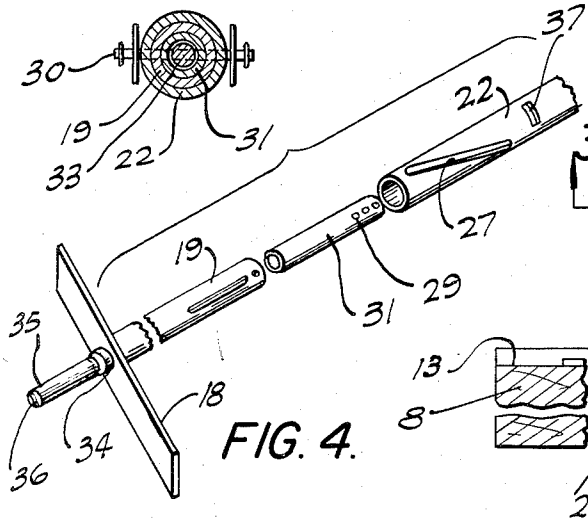


FIG. 4.

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HOLLOW DOOR CONSTRUCTION

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7 Claims. (Cl. 20—38)

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My invention relates to a new and useful improvement in a hollow door construction.

In hollow doors, as constructed, side rails and end rails are usually provided which are secured together to form a close frame. The end rails extend across the top and bottom and usually there are braces connecting the end rails together. Secured to the outer side of the frame thus constructed is a panel generally formed from veneer wood. Experience has shown that this provides a light, economically manufactured and durable door. Experience has also shown that a door so constructed frequently warps out of its normal position.

The situation is also frequently encountered that the door frame is not true or plumb and consequently in order to properly hang the door in the frame it may be necessary to warp it out of its normal position to conform to the distortion of the door frame.

It is an object of the present invention to provide a door construction of this class embodying a mechanism whereby the bottom rail and the top rail may be relatively moved around the transverse medial axis of these rails as an axis so that, should the door have become warped, the structure may be realigned and the distortion eliminated.

Another object of the invention is a provision in a door of this class of a rotatable member adapted for moving a member longitudinally for effecting a relative rotation of members secured to the end rails of the door.

Another object of the invention is to provide a mechanism for truing a door of this class which will be simple in structure, economical of manufacture, durable, compact, light, easily and quickly operated, and easily and quickly installed in the door construction.

Other objects will appear hereinafter.

It is recognized that various modications and changes may be made in the detail of structure illustrated and it is intended that the present disclosure shall be considered but the preferred embodiment.

Forming a part of this application are drawings in which:

Fig. 1 is an elevational view of a door embodying the invention with parts broken away,

Fig. 2 is an elevational view of the mechanism mounted in the door with parts broken away, parts shown in elevation and parts in section and with the oppositely disposed end rails shown sectionally in fragment,

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2,

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Fig. 4 is a perspective view of some of the parts of the invention shown in separated relation.

In the drawings I have illustrated the invention used with a door embodying the top rail 7, the bottom rail 8 and the side rails 11 and 12 secured together to form a closed frame. In the inner face of the bottom rail 8 and extending longitudinally thereof from end to end is a groove 13. A similar groove 14 is formed in the inner face of the top rail 7. Engaging at their opposite ends in these grooves are reenforcing braces 15 which are secured at their ends to the top and bottom rails.

Positioned in the groove 14 is a plate 16 which is securely attached to the top rail 7. Secured to this plate 16 and projecting downwardly therefrom is a tube 17.

Positioned in the groove 13 of the bottom rail 8 is plate 18 which is securely fastened to the bottom rail 8. Secured at one of its ends to the plate 18 and projecting upwardly therefrom is a tube 19. An opening 20 is formed in the plate 18 concentric with the tube 19 and in registration with the passage 21 formed in the bottom rail 8.

The tube 17 telescopes with the upper end of a tube 22 and is secured thereto by a rod 23 extended through both of these tubes 17 and 22. The tube 17 is provided with an additional opening 25 registering with an opening 24 formed in the tube 22, so that the location of the rod 23 may be varied.

The tube 22 is secured at its lower end by a rod 26 which is projected through a circumferential slot 37 formed therein and through an opening 38 formed through the tube 19 adjacent its upper end.

Formed in the tube 22 are diametrically opposite spiral slots 27. Slidably positioned in the tube 19 is a tube 31 through which are formed openings 29 through which is projected a rod 30 extending through the spiral slots 27. The tube 31 is formed with a nut forming end wall 32 into which is threaded a screw 33. This screw 33 extends through the opening 20 and is provided with a head 34 engaging in a recess 39 formed in the rail 8. The passage 21 opens into the recess 39 so that the bottom of the recess 39 serves as an abutment for the head 34. Extending downwardly from this head 34 is a reduced extension 35 of the screw 33 provided in its end with a slot 36 for accommodating a screw driver.

When the construction is assembled in the door and the door is in its normal upwarped condition the rod 33 will be projected through one of the openings 29 so as to extend through the spiral

slots 27 substantially midway between their ends. When the construction is assembled, as shown in Fig. 2, the rotation of the screw 33 will effect a slidable movement of the tube 31, carrying with it the rod 30. As this rod 30 travels lengthwise in the spiral slots 27 the tube 22 will be rotated relatively to the tube 19. This rotation is, of course, limited by the length of the circumferential slots 37. As the tube 22 is rotated relatively to the tube 19 this would, of course, put a twisting strain on the opposite ends of the door, tending to twist the end rails 7 and 8 relatively to each other on the axis of the tube 22 as a center. This twisting may be effected in either direction, depending upon the direction of rotation of the screw 33. In this way the warping, which may occur in the door, may be corrected. Likewise if it is desired to twist the door slightly out of true position to fit a distorted frame the warping may also be effected. In this way I have provided a simple and effective means for truing a door constructed in this manner and the mechanism has proven most efficient in use.

The members 17 and 22 may be said to, together, constitute a stem and the member 19 may also be said to constitute a stem.

What I claim is:

1. In combination with a door embodying a top rail, a bottom rail and a pair of oppositely disposed side rails connected together to provide a closed frame and a panel mounted on opposite sides of said frame: a stem secured to the top rail and projected downwardly therefrom within the door; a stem secured to the bottom rail and projecting upwardly therefrom within the door in alignment with said first-named stem; a nut bearing member slidable longitudinally of one of said stems and having a threaded nut formed therein; a screw in axially fixed relation to said bottom and top rails and threadable into said nut for moving said nut bearing member longitudinally of said stems; and a pressure exerting member carried by said nut carrying member engageable with one of said stems for, upon longitudinal movement of said nut bearing member relatively thereto, exerting a twisting strain on the stem for effecting a relative rotative movement of said stems.

2. In combination with a door embodying a top rail, a bottom rail and a pair of oppositely disposed side rails connected together to provide a closed frame and a panel mounted on opposite sides of said frame: a stem secured to the top rail and projected downwardly therefrom within the door; a stem secured to the bottom rail and projecting upwardly therefrom within the door in alignment with said first-named stem; a nut bearing member slidable longitudinally of one of said stems and having a threaded nut formed therein; a screw in axially fixed relation to said bottom and top rails and threadable into said nut for moving said nut bearing member longitudinally of said stems; and a pressure exerting member carried by said nut carrying member engageable with one of said stems for, upon longitudinal movement of said nut bearing member relatively thereto, exerting a twisting strain on the stem for effecting a relative rotative movement of said stems; and an abutment member carried by one of said stems and inter-engageable with the other for limiting said relative rotative movement within predetermined limits.

3. In a door construction of the class described having a bottom rail, a top rail and a pair of

oppositely disposed side rails secured together to provide a closed frame and provided with a panel on opposite sides of said frame for closing the same: a tube secured to the top rail in fixed relation thereto and projecting downwardly; a tube secured to the bottom rail in fixed relation thereto and extending upwardly and telescoping with said first named tube; an engagement member engageable with one of said tubes and movable longitudinally thereof for transmitting to the tube engaged a rotative thrust for effecting a twisting strain on the tube so engaged and a relative rotation of said tube; and a threaded member for, upon being rotated, affecting a longitudinal movement of said engagement member relative to the tube engaged.

4. In a door construction embodying an upper rail, a lower rail and a pair of spaced-apart side rails and a panel secured to the opposite sides of each of said rails for closing the frame defined by said rails: a tube secured in fixed relation to the lower face of said top rail between said panels and projecting downwardly therefrom; a tube secured in fixed relation to the upper face of said lower rail between said panels and projecting upwardly therefrom and telescoping with said first named tube; an axial slot in one of said tubes; a longitudinally spirally directed slot in the other of said tubes at the location of said axially directed slot; a rod extended through said slots; a member slidably positioned in said tubes and movable longitudinally thereof and carrying said rod; and a threaded member for moving said rod longitudinally of said tubes for effecting relative rotation of said tubes.

5. In a door construction embodying an upper rail, a lower rail and a pair of spaced-apart side rails and a panel secured to the opposite sides of each of said rails for closing the frame defined by said rails; a tube secured in fixed relation to the lower face of said top rail between said panels and projecting downwardly therefrom; a tube secured in fixed relation to the upper face of said lower rail between said panels and projecting upwardly therefrom and telescoping with said first named tube; an axial slot in one of said tubes; a longitudinally spirally directed slot in the other of said tubes at the location of said axially directed slot; a rod extended through said slots; a member slidably positioned in said tubes and movable longitudinally thereof and carrying said rod; and a threaded member for moving said rod longitudinally of said tubes for effecting relative rotation of said tubes; and a second rod extended through diametrically opposite openings in one of said tubes and through diametrically opposite circumferential slots in the other of said tubes registering with said openings for limiting relative rotation of said tubes.

6. In a door construction of the class described embodying an upper rail and a lower rail connected to spaced-apart oppositely disposed side rails; a plate secured in fixed relation to the lower face of said top rail and extending at opposite sides of the medial line thereof; a stem secured to said plate in fixed relation thereto at substantially the medial line thereof and projecting downwardly therefrom; a plate mounted on the upper face of the lower rail at substantially the medial line thereof in fixed relation thereto; a stem secured to said plate in fixed relation thereto at substantially the medial line thereof and projecting upwardly in alignment with and telescoping with said first named stem, one of said

stems having diametrically opposite longitudinally extending spirally directed slots formed therein and the other of said stems having diametrically opposite longitudinally directed axially extended slots formed therein in longitudinal registration with the spirally directed slots; a rod projected through said slots; and a screw operated mechanism for moving said rod longitudinally of said slots and effecting a relative rotation of said stems.

7. In a door construction of the class described embodying an upper rail and a lower rail connected to spaced-apart oppositely disposed side rails; a plate secured in fixed relation to the lower face of said top rail and extending at opposite sides of the medial line thereof; a stem secured to said plate in fixed relation thereto at substantially the medial line thereof and projecting downwardly therefrom; a plate mounted on the upper face of the lower rail at substantially the medial line thereof in fixed relation thereto; a stem secured to said plate in fixed relation thereto at substantially the medial line thereof and projecting upwardly in alignment with and telescoping with said first named stem, one of said stems

having diametrically opposite longitudinally extending spirally directed slots formed therein and the other of said stems having diametrically opposite longitudinally directed axially extended slots formed therein in longitudinal registration with the spirally directed slots; a rod projected through said slots; and a screw operated mechanism for moving said rod longitudinally of said slots and effecting a relative rotation of said stems; and an abutment member inter-engaging at said stems for limiting the relative rotation thereof within predetermined limits.

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