

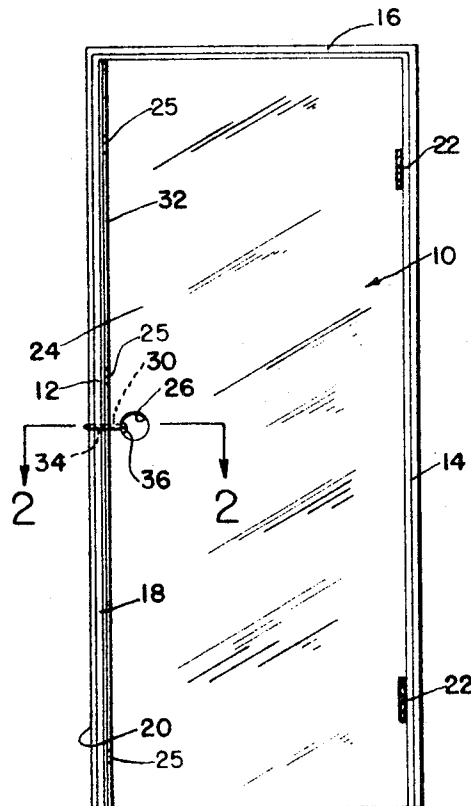
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[21] Appl. No. **879,847**
[22] Filed **Nov. 25, 1969**
[45] Patented **July 20, 1971**
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Peoria, Ill.

[56] **References Cited**
UNITED STATES PATENTS
2,720,308 10/1955 Howell, Jr. 49/380 X
2,728,956 1/1956 Jackson..... 49/380
Primary Examiner—Kenneth Downey
Attorney—Harbaugh and Thomas

[54] **SHIPPING DOOR LOCK**
12 Claims, 7 Drawing Figs.

[52] U.S. Cl..... **49/380,**
206/60
[51] Int. Cl..... **E06b 1/00**
[50] Field of Search..... **49/380;**
206/46 H, 60

ABSTRACT: A retainer for a prehung door unit to maintain the squareness and alignment of the door within its frame during shipping and installation which is readily installed in existing lock, latch and keeper openings, having a member mating with the latch opening, and a member, separable or integral therewith mating with the keeper opening and a fastener engageable through the mating members and the door jamb to hold the door in place and releasable for removal of the securing device after installation of the unit.



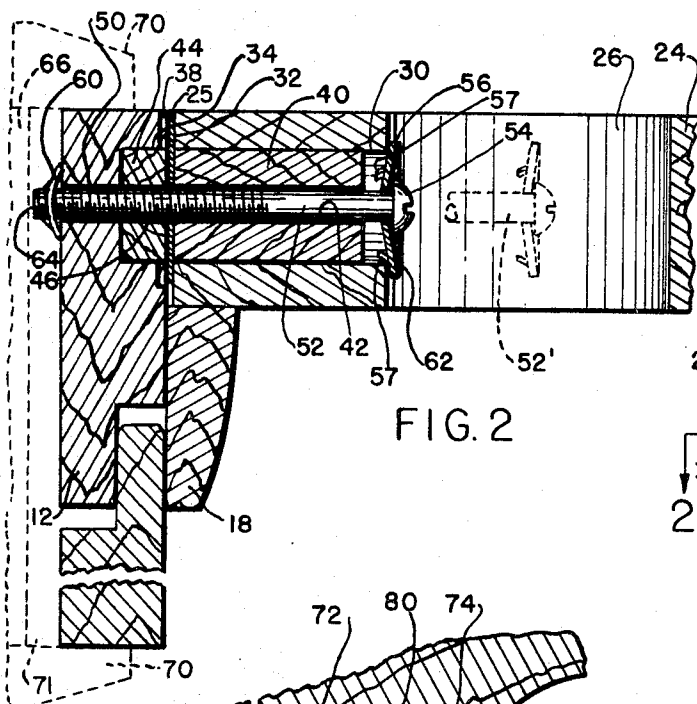


FIG. 2

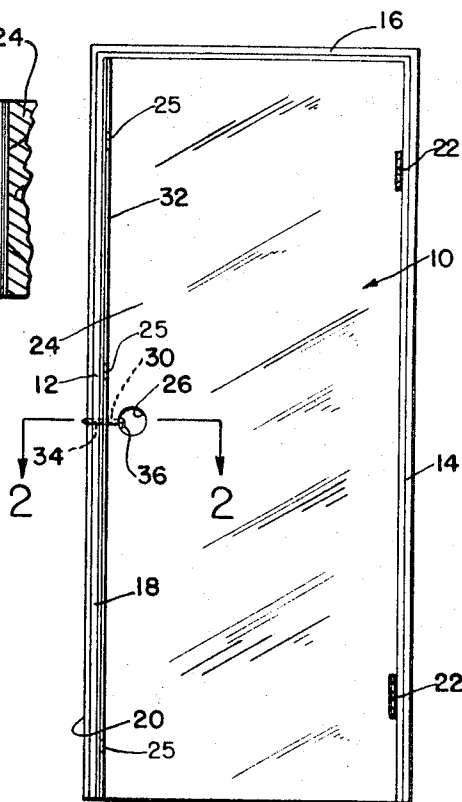


FIG. 1

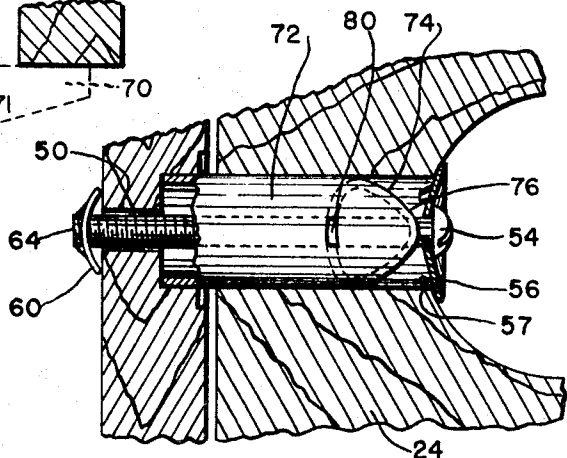


FIG. 4

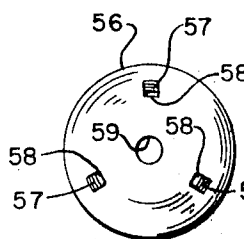


FIG. 5

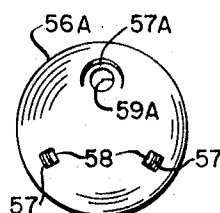


FIG. 5A

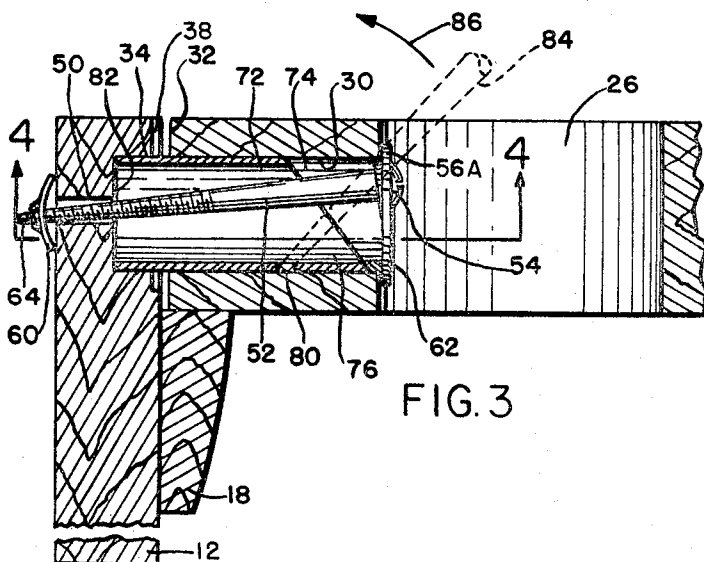


FIG. 3

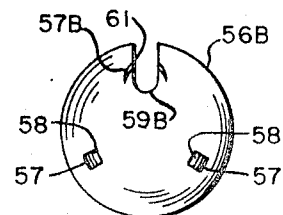


FIG. 5B

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SHIPPING DOOR LOCK

BACKGROUND OF THE INVENTION

Prefabricated metal and wooden door and door frame units are now commonly used in the construction field, such units being designed to reduce labor costs in home building by taking full advantage of factory machinery and its capability in producing precut precision parts, and assembling them ready for erection at the job site. This practice has eliminated part, if not all, of the time and labor required to accurately hang a door from the hinges within its frame. A related problem of shipping and supplying such prehung and preassembled door casing and jamb combinations in a condition so that it retains its dimensions and trueness has however been created.

To overcome any chance of damage or misalignment of a prehung door in its frame, it is the present practice to provide temporary securing means, in addition to the hinges, to retain the edges of the door in properly spaced and aligned relationship with the structural sections of the mounting frame or casing. For this purpose temporary retaining clips, particularly for aluminum doors, are used. Wooden doors and frames present the additional problem of being subject to marring and require that any holes and the like for fastening members be minimal in size and hidden from view. One type of retaining clips are shown in U.S. Pat. No. 2,927,352. Other types of retaining clips are shown in U.S. Pat. Nos. 3,411,240 and 2,721,634.

Jackson in Re 24,285 first affixes the top jamb members together with a metal plate overlying a metal tenon and they are clamped together by a cross bolt. Jackson also discloses the use of a dowel rod fitted in the lock bolt opening at one end and into the bolt aperture of the jamb member at the other end. A transverse anchoring pin or nail is driven through the dowel rod to retain it in the lock opening and a screw is turned into the dowel rod from the back of the jamb so that the rod is drawn into the bolt aperture. The necessity of using the transverse pin or nail makes the removal of the dowel rod difficult and creates the danger of injuring the door during the removal process. The Jackson device, as well as other prior art devices, must be removed before installation, thereby prematurely losing the security needed to maintain the squareness and alignment of the door assembly during this crucial stage. The present invention overcomes these and related problems.

SUMMARY OF THE INVENTION

The most effective, safe and convenient means for securing a door within its door frame during shipping and installation in the wall is one which avoids any contact with exposed surfaces of door or frame, leaves no visible holes or grooves and does not require the use of any special tools or hardware to disassemble. The securing means to be practical must be effective enough to be usable with the door hinges as the only other attachment between the door and its frame and thus avoid the necessity of additional securements required by the prior art, at the top and bottom edges of the door. The present invention provides such means.

In one embodiment of this invention axially bored dowel rods are placed within the latch opening and the keeper opening and are secured by a releasable fastener inserted at the lock opening longitudinally through the dowels where they are locked by a screw through the door jamb, preferably by a speed nut. In this way the securing device can be left on the door for safety and strength until after the door and its frame are installed in a wall opening assuring the squareness and alignment of the unit. In another embodiment an inexpensive cardboard or plastic tube is substituted for the dowel rods.

The advantages of the present invention may best be understood by reference to the following description taken in connection with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS:

FIG. 1 is a side plan view of a complete prehung door and frame assembly held by the device of this invention ready for shipment and installation.

FIG. 2 is a fragmentary partial sectional view taken along the lines 2-2 of FIG. 1 showing one embodiment of the invention.

FIG. 3 is a fragmentary partial sectional view similar to FIG. 2 showing another embodiment of the invention.

FIG. 4 is a fragmentary partial sectional view taken along the lines 4-4 in FIG. 3.

FIG. 5 is a plan view of one form of washer usable in the securing device of this invention.

FIG. 5A is a plan view of another form of washer for a slanted bolt usable in the securing device of this invention.

FIG. 5B is a plan view of another form of washer usable in the securing device of this invention.

THE PREFERRED EMBODIMENT

The door assembly 10, as shown in FIG. 1, may be of metal or wood and comprises jamb members 12 and 14 to which is attached, by appropriate means, a header 16 to form the door frame 20. A door stop 18, better shown in FIGS. 2 and 3, is attached to the jamb member 12 by suitable means. Hinges 22 are attached at predetermined positions on the jamb member 14, preferably with screws, and are attached, preferably by the same means, to corresponding positions on the frame 20 so that the door 24 is free to swing on the hinges 22 in the door frame 20. The hinges 22 are merely illustrative as to placement along the side edge of the door, it being understood that the door 24 can be hung to swing in either or both directions, depending on the location or absence of the stop 18. Spacers 25 are provided as needed between the door 24 and jamb member 12 for proper alignment of the unit.

The door 24 is transversely bored to provide the lock opening 26. The latch opening 30 is a transverse bore at a right angle to the jamb member 12 and extends inwardly from the outer edge 32 of the door 24 where it diametrically intersects the lock opening 26. The jamb member 12 is provided with a keeper opening 34 which extends partially through the jamb member 12, preferably about halfway, and is axially aligned with and preferably of the same circumference as the latch opening 30. The latch opening 30 and the keeper opening 34 are generally circular in configuration but may also have an angular cross section in which case subsequent references herein to the diameter of said opening contemplates the major sectional dimension of the opening. The jamb member 12 is preferably machined to receive the strike plate in a recess 28 (FIG. 2). The door 24 is hung in a manner assuring proper clearances and alignment, so that skilled workmanship will not be critical at the installation site. To maintain alignment, the door is secured by the securing or retaining device 36, as shown more particularly in FIGS. 2, 3 and 4.

Referring to FIG. 2, one form of shipping door lock or retainer of this invention is shown. The dowel rod portion 40 is inserted in the latch opening 30 in the door 24 and is axially bored to provide the longitudinal opening 42. The diameter of the dowel rod portion 40 is substantially the same as that of the latch opening 30 so that the dowel rod portion 40 may be inserted and removed but will fit snugly within the latch opening 30. The length of the dowel rod portion 40 is no greater than and preferably is less than, the axial dimension of the latch opening 30.

The shipping door lock of this invention, illustrated in FIG. 2 has the second dowel rod portion 44 which is inserted within the keeper opening 34 in the jamb member 12 and is axially bored as indicated by the opening 46. The opening 46 in the dowel rod portion 44 is aligned with and preferably has substantially the same diameter as the opening 42 in the dowel rod portion 40. The dowel rod portion 44 has a diameter substantially the same as that of the keeper opening 34 so that the dowel rod portion 44 may be inserted and removed but will fit

snugly within the keeper opening 34. The length of the dowel rod portion 44 is no greater than, and preferably substantially equal to the axial dimension of the keeper opening 34. If the latch opening 30 and keeper opening 34 have different diameters from each other, the operability of the invention is not affected as long as the dowel portions 40 and 44 have diameters corresponding to their respective openings. The dowel rod portions 40 and 44 are preferably made of wood but may also be constructed of any disposable metal or plastic exhibiting adequate strength.

The jamb member 12 is transversely bored along the axis of the keeper opening 34 to provide the opening 50 extending from the keeper opening 34 through the remainder of the jamb member 12. The opening 50 in the jamb member 12 is aligned with and preferably, but not necessarily, substantially equal in diameter to the opening 46 in the dowel rod portion 44.

As part of the device, a releasable fastener 52 is provided which may be a bolt, screw, quick lock, or any other fastening device, and of which the elongated bolt 52 shown is illustrative. This bolt 52 is inserted through the openings 42, 46 and 50 in the dowel rod portion 40, the dowel rod portion 44 and the jamb member 12, respectively. The bolt 52 can be of any suitable type and has a diameter not greater than and preferably substantially equal to that of the openings 42, 46 and 50 so that the bolt 52 can be inserted and removed, but will fit snugly within the openings 42, 46 and 50, so that the bolt is placed in shear to hold the dowel portions and openings in alignment and the assembled parts in place. The head 54 of the bolt 52 is preferably slotted to be usable with a plain screwdriver but may be a Phillips head or a hex-head or any convenient type, including a hand loosened type. The head 54 is secured at the end of the latch opening 30 adjoining the lock opening 26 by the washer 56 so that the bolt 52 extends a predetermined distance beyond the jamb member 12 where it is secured by a speed nut 60. If desired, the speed nut 60 can be dispensed with by providing for engagement between the fastener 52 and the opening 50 in the jamb member 12, as by a wood screw. The washer 56 (see FIG. 5) is preferably frustoconical in shape or cylindrically bowed so as to recess slightly into the latch opening 30 and at the same time conform to the inside curved surface of the lock opening 26 and thus contact and seat against the entire peripheral edge 62 of the latch opening 30 when pulled into place by the bolt. The washer 56 may be flat or may have any suitable shape and may even be replaced by any device, such as a stiff wire, properly formed for the purpose. The tabs 57 are provided to align and center the washer 56 with the latch opening 30. The details of the washer 56 are further illustrated in FIG. 5 where the slots 58 are shown resulting from the punching out of the tabs 57. In the washer 56 is the aperture 59 through which the bolt 52 is inserted. Instead of three punched-out tabs 57, as illustrated, the washer 56 can be provided with a pair of tabs diametrically opposite the aperture 59.

When the bolt 52 is tightened down with speed nut 60, it pulls the door 24 in conjunction with the washer 56, against the spacers 25 and away from the hinges 22 (see FIG. 1) to provide at least a three point stabilizing system preventing any translational motion of the door 24 relative to the door frame 20. At the same time, the door 24 is held securely against any rotational motion by the radial fit of the dowel members within the respective openings as unified by the bolt 52. Any tendency for the door 24 to move rotationally on its hinges 22 is overcome by the bolt 52 which counteracts and carries in shear any lateral thrust applied by the attempted relative motion of the door 24 and the jamb member 12. Thus, the bolt 52 absorbs and counteracts all of the forces, lateral, longitudinal, or otherwise which may cause relative movement between the door 24 and the door frame 20 during handling and installation. Any resulting forces acting on the door 24 and jamb member 12 are applied through the large surface areas of the dowel rod portions 40 and 44, respectively, so that no damage is caused thereby.

Assembly of the securing device is particularly simple and represents an advantage of this invention. The lock opening 26, latch opening 30, keeper opening 34 and jamb or bolt opening 50 are bored as part of the process of manufacture of the door assembly. After the door 24 is hung on the completed frame 20 and disposed in an open position, the bolt 52 and washer 56 are inserted at an angle through the lock opening 26 and aligned and passed part way into the latch opening 30. The dowel rod portion 40 is then inserted into the latch opening 30 and over the bolt 52 so that it is within the opening 42. The dowel rod portion 44 is placed flush into the keeper opening 34.

Next, the bolt 52 is pulled into the lock opening at least to the position shown by the bolt 52', represented by broken lines, so that the threaded end 64 of the bolt 52 extends no further than the edge 32 of the door 24. The door 24 is moved to its closed position. Now the bolt 52 is pushed through the opening or central bore 46 in the dowel rod portion 44 and also into and through the opening 50 in the jamb member 12 so that the washer 56 abuts the surface of the lock opening 26 at the edge 62 of the latch opening 30. The speed nut 60 is applied at the threaded end 64 of the bolt 52 and the assembly is tightened with a screwdriver or other edged instrument applied at an angle through the lock opening 26. In this manner, the door and frame assembly are secured as a unit and ready for shipment and subsequent installation.

Unlike prior art devices, the securing device need not be removed until after the door assembly has been mounted in the wall 66 and all necessary trim, as illustrated by the finishing strips 70, has been applied. Then it can be removed by a workman with only a screwdriver. Unscrewing the bolt 52 causes the disposable speed nut 60 to loosen and release the threaded end 64. The expendable speed nut 60 remains within the space 71 between the wall 66 and the jamb member 12. The bolt 52 is then pulled into the lock opening 26 at least as far as shown at 52' so that the door can be opened. The two dowel rod or shaft portions 40 and 44 are removed and the bolt 52 and washer 56 can be pulled through the lock opening 26 to complete disassembly. Since the installation of the door has already been completed, proper spacing and alignment are assured since the door has been secured through the entire process.

Another embodiment of the present invention is shown in FIGS. 3 and 4. Here, the single tubular member 72 is used instead of the dowel rod portions 40 and 44 in FIG. 2. The tube 72 is preferably made of a heavy cardboard but can also be constructed of any suitable plastic or metal which is sufficiently inexpensive, strong and easily formed to the desired shape. A tube made of such material is disposable. One advantage of constructing the tube 72 of plastic is that it can be cut from inexpensive plastic tubing available on the market in different sizes. The outer diameter of the tube 72 is no greater than and is preferably substantially the same as the matching diameters of the latch opening 30 and the keeper openings 34 so that it may be inserted and removed but will fit snugly in circumferential contact within the openings. The tube 72 preferably is cut at an angle to the longitudinal axis along the edge 74 creating the extended lip 76 which is provided with the slot 80 defining an arc preferably opposite the innermost point of the edge 74. The lip 76 and the slot 80 are provided to facilitate rapid, easy removal of the tube using a screwdriver in a manner to be described. However, if desired, these parts may be omitted and the tube made entirely cylindrical or in any other desirable shape. Other constructions include the elimination of the slot 80 and providing a bentover or melted-back edge at the tip end of the lip 76 depending on whether the tube is made of metal or plastic. The length of the tube 72 is no greater than, and preferably just less than, the distance from the inner wall 82 of the keeper opening 34 to the edge 62 of the latch opening 30 at the lock opening 26.

The fastener, exemplified by the screw or bolt 52, is positioned with its head 54 held by the washer 56 at the end of the latch opening 30 intersecting the lock opening 26. The bolt 52

extends longitudinally through the tube 72 and the opening 50 in the jamb member 12 where it is secured by the speed nut 60 applied to the threaded end 64.

Other embodiments of the washer 56 are possible including the washer 56A shown in FIG. 5A and the washer 56B illustrated in FIG. 5B. The washer 56A has the enlarged tab 57A which is bored to provide the aperture 59A therein. The use of the washer 56A is illustrated in FIG. 3 and will be explained herein. The washer 56B is substantially similar to washer 56A except that radial slot 61 is provided intersecting the aperture 59B on the tab 57B for a purpose also to be demonstrated.

When the bolt 52 is tightened, it pulls the door 24, in conjunction with the washer 56, against the spacers 25 in the direction, opposing the pull of the hinges 22 (see FIG. 1) and provides at least a three point suspension preventing translational motion of the door 24 relative to the door frame 20. This longitudinal tightening of the bolt 52 also prevents any swinging movement of the door 24 on the hinges 22 by eliminating lateral thrust. The tube 72 holds the door 24 firmly and absorbs and counteracts any existing lateral thrusts which could otherwise cause rotational motion. Any forces acting on the door 24 and jamb member 12 are applied over the large surface area of the tube 72 eliminating the possibility of damage or dislodgement.

The assembly process of this embodiment of the invention is again a relatively simple procedure. After the door assembly has been constructed, spaced and aligned and while the door is in an open relationship with the frame, the tube 72 is inserted entirely into the latch opening 30 so that the lip 76 extends into the lock opening 26. The door 24 is closed and the tube 72 is pushed into the latch opening 30 until the lip 76 clears the edge 62. This seats the tube 72 firmly within the keeper opening 34. The bolt 52 and the washer 56 can be easily inserted via the lock opening 26 longitudinally through the tube 72 and the opening 50 in the jamb member 12. The speed nut 60 is affixed to the threaded end 64 of the bolt 52 which is then tightened with a screwdriver, completing the assembly. The use of the washer 56A or 56B, as shown in FIG. 4, makes tightening and loosening of the fastener 52 easier by so orienting it that the screwdriver may be longitudinally aligned with the fastener through the lock opening 26. It is apparent that a cardboard or plastic tube of this kind is particularly convenient since its length can be readily foreshortened to accommodate any differences in the spacing between the door edge 32 and the inside of the jamb 12 by merely slicing off a little at either end with a knife.

After shipment and installation of the door assembly, the securing device can be quickly removed. First the bolt 52 is loosened releasing the threaded end 64, and removed via the lock opening 26. The tube must then be retracted into the lock opening 26 to facilitate the opening of the door. This is readily accomplished by inserting a screwdriver 84, shown in broken lines, through the lock opening 26 and into the tube 72 so that its tip enters the slot 80. The handle of the screwdriver is moved in the direction indicated by the arrow 86 and the shank strikes the edge 62, which serves as a fulcrum, so that continued pressure on the handle pulls the tube 72 out of the bore 30, or at least to the point where the edge 74 strikes the shank of the screwdriver. The cutaway portion of the tube 72 opposite the slot 80 enables substantially the entire lip 76 to be pulled into the lock opening 26 so that the tube 72 leaves the keeper opening 34 and the door may be opened. The lip 76 is then pushed back into the latch opening 30 and the tube or tubular shaft 72 is pulled out of the other side. The tube 72 may be inserted and removed through the lock opening 26 while the door is in the closed position whenever this is permitted by the dimensions of the door. Some doors must be constructed with the latch opening 30 very long relative to the diameter of the lock opening 26 so that fastener 52 cannot be removed through the lock opening 26. Use of the washer 56B, shown in FIG. 5B, alleviates this problem. The tube 72 and fastener 52 are inserted into the latch opening 30 while the door is in its open position. The door is closed and the slot 61

of the washer 56B slipped under the head 54 of the fastener 52. Installation may be completed as before. For removal, the washer 56B may be slipped off of the loosened fastener 52 which is removed with the tube 72 after the door is opened.

In this manner inexpensive, disposable door to frame securing means are provided which are easily assembled and disassembled using only a screwdriver and which may remain in place guaranteeing proper spacing and alignment until the installation is complete.

We claim:

1. In a door assembly including a door and a jamb member wherein said door is provided with a lock opening and an intersecting latch opening at one edge, with the jamb member having coaxial keeper and bolt openings, substantially opposite thereto in the normally closed position of the door, a securing device comprising:

axially bored shaft means fitted in said latch opening and said keeper opening;

securing means in said bore in said shaft means having one end releasably held at the intersection of said latch and lock openings and the other extending through said bolt opening, and

releasable fastening means engaged by said other end of the securing means beyond said bolt opening and releasable by manipulation of said one end of the securing means from within said latch and keeper openings.

2. A securing device in accordance with claim 1 wherein said securing means is threadedly attached through said bolt opening and said releasable fastening means is threaded and nonrotatively disposed on the concealed side of the frame remote from the door.

3. A securing device in accordance with claim 2 including washer means holding said securing means rotatably for release at the intersection of said latch and lock openings.

4. A securing device in accordance with claim 1 wherein said axially bored shaft means is tubular and including washer means interengaging said shaft means and securing means to hold said shaft means radially spaced from said securing means.

5. In a door assembly including a door and a jamb member wherein said door is provided with a lock opening and an intersecting latch opening at one edge, with the jamb member having coaxial keeper and bolt openings, substantially opposite thereto in the normally closed position of the door, a securing device comprising:

axially bored shaft means fitted in said latch opening and said keeper opening;

securing means in said bore in said shaft means having one end held at the intersection of said latch and lock openings and the other end releasably attached through said bolt opening;

said axially bored shaft means being tubular and radially spaced from said securing means; and

said tubular shaft means having lip means extending toward said intersection of said latch and lock openings and catch means as provided on the inner surface of said lip means to engage a removal tool.

6. A securing device in accordance with claim 5 wherein said catch means is spaced from the extended end of said lip means.

7. A securing device in accordance with claim 5 wherein said catch means is at the inner end of said lip means.

8. A securing device in accordance with claim 5 wherein said catch means is at the extended end of said lip means.

9. A securing device in accordance with claim 1 wherein: said axially bored shaft means comprises a first rod means and a second rod means;

said first rod means is fitted in said latch opening;

said second rod means is fitted in said keeper opening; and said securing means is fitted within said axial bores in said rod means.

10. In a door assembly including a door and a jamb member wherein said door is provided with a lock opening and an in-

intersecting latch opening at one edge with the jamb member having coaxial keeper and bolt openings substantially opposite thereto in the normally closed position of the door, a securing device comprising:

- a tubular shaft means fitted in said latch opening and said 5
keeper opening having lip means extending toward said intersection of said latch and lock openings;
- catch means at the inner end of said lip means to engage a removal tool;
- securing means in said tubular shaft means having one end 10
held by washer means at the intersection of said latch and lock openings and the other end attached through said bolt opening to releasable fastening means.

11. In a door assembly including a door and a jamb member wherein said door is provided with a lock opening and intersecting latch opening at one edge with the jamb member having coaxial keeper and bolt openings substantially opposite thereto in the normally closed position of the door, a securing device comprising:

- an axially bored first rod means fitted in said latch opening;
 - an axially bored second rod means fitted in said keeper opening; and
 - securing means having one end held by washer means at the intersection of said latch and lock openings fitted within said axial bores in said rod means and having its other end extending through said bolt opening and jamb member, and
 - releasable fastening means nonrotatably engaging said jamb member and rotatably engaged by said securing means for release therefrom by rotation of said one end of said securing means at said latch and lock openings.
12. The combination called for in claim 11 in which said washer means has tabs locating said washer means concentrically with said latch opening and an aperture through it disposing said one end of the securing means eccentrically in said latch opening at said lock opening.

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