A bushing for use with a door plug for securing a door to a metal frame. Said door prepped to receive the door plug with the door plug extended from an edge bore of the door and extended through a striker prep opening of said metal door frame. Said striker prep opening oversized for the extended end of said door plug. Said bushing configured to have a protrusion exterior mated to the striker prep opening and a through bore mated to the extended end of said door plug. Said bushing inserted into the striker plate opening and said door plug end extended through the through bore of said bushing whereby a fastener secured to the extended end of the door plug secures the door to the metal frame.
SHIPPING RETAINER FOR PREHUNG DOORS

FIELD OF THE INVENTION

[0001] This invention relates to a retainer to facilitate shipment of prehung doors and more particularly to a bushing that enables the use of retainers currently in use but for doors alternatively prehung in metal door frames.

BACKGROUND OF INVENTION

[0002] A popular retainer in use by door manufacturers for shipping wooden doors prehung in wood frames is disclosed in commonly owned U.S. Pat. No. 5,159,782. The disclosure of U.S. Pat. No. 5,159,782 and a follow up U.S. Pat. No. 5,562,315 (also commonly owned) are incorporated herein by reference. As illustrated in the '782 patent, the wood doors are prepped with configured openings to receive door handles and latch mechanism and the wood frames are prepped to receive striker plates but the handles and latching mechanism and the strike plates are installed after the door and frames are shipped to the building site. The retainers hold the door in a closed position in the frame during shipping.

A more recent development is the hanging of doors in metal frames. As configured in the '782 patent, the retainer of that patent as used for wood frames is not usable for metal frames. The metal sheeting that forms the metal frames is substantially less thick than a wood frame, and instead of a conventional opening for a door latch, the metal frame is provided with a configured cutouts having tabs or the like for receiving screws or small bolts for securing striker plates and other hardware to the metal frame. The cutouts of the metal frame do not accommodate the '782 retainer, and door manufacturers, e.g., when assembling doors to metal door frames, have been compelled to use other less satisfactory retention devices.

BRIEF DESCRIPTION OF INVENTION

[0004] A stimulus for this invention was the desire to use the same concept as used for wood doors. Even further, it was considered desirable to use the same retainer if doable, and the present invention, as provided in a preferred embodiment, accomplishes that objective. A bushing was devised that fits the configured cutout of the metal frame and substantially converts the cutout to the configuration of a standard wood frame. Manufacturers of both wooden and metal frames need only carry the single retainer type of the '782 patent, and when securing the door to a metal frame, may need only to incorporate the bushing.

[0005] In a preferred form, the bushing is designed to accommodate several variables. Door thicknesses are of two different types: 1¾" versus 1¾". This translates into a ¾" difference in the location of the center line of the edge bore of the door (though which the retainer is extended into the configured opening of the door frame). Thus, the bushing in the door frame desirably can be shifted ¾" depending on whether the door is a 1¾" door or a 1¾" door. The bushing includes a boss or protrusion portion at one side that fits the configured opening of the metal frame and which is rotatable 180° to accommodate the different door sizes. Metal door frames are basically of two different types as concerns the configured opening. The bushing is provided with a further protrusion at the opposite side of the bushing that fits the second opening configuration and it is again rotatable 180° to fit the two different door sizes.

[0006] The invention in its presently preferred form is a bushing that adapts the '782 patented retainer to accommodate metal door frames. This invention and its numerous benefits will be more fully appreciated upon reference to the following detailed description having reference to the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0007] FIG. 1 is a pictorial illustration of a wood door hingedly secured to a metal frame;

[0008] FIG. 2 is a pictorial and exploded view of a door plug with bushing in accordance with the present invention;

[0009] FIG. 3 is a cross sectional view illustrating the door plug and bushing of FIG. 2 inserted through a wooden door and into a metal frame;

[0010] FIGS. 4-9 are views of a bushing in accordance with the present invention;

[0011] FIGS. 10A and 10B are face views of one type of a metal jamb with the bushing of FIGS. 4-9 inserted into the striker plate prep; and

[0012] FIGS. 11A and 11B are face views of a further type of metal jamb with a bushing inserted into the striker plate prep.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0013] Reference is first made to FIG. 1 which illustrates a wood door 10 mounted in a metal frame 12. As will be observed from the cross section view of FIG. 3 (as if taken on view lines 3-3 of FIG. 1 but with the door 10 closed against the door jamb 14 of frame 12), the door jamb 14 is configured with strap portion 16 provided to secure the frame into the door opening of a building. As will also be observed, the door plug 18 extends through the thin metal wall of door jamb 14. As will be further observed, the prep opening 20 through which the door plug protrudes is substantially oversized relative to the door plug. Thus for both these reasons, the door plug by itself will not provide a desired secure holding of the door 10 in the frame 12, i.e., for shipment of the door and frame to a building site.

[0014] The oversized prep openings 20 will be further noted from FIGS. 10A and 10B. It will be observed that the prep opening 20 is configured to have inset tabs 22 with bolt receiving openings 24 that enable the assembly of a striker plate (not shown). The inset configuration of inset tabs 22 enables the plate to be mounted flush with the outer wall of the jamb 14. The openings 24 are elongated as shown to allow a variation of ¾" and thereby accommodate two different standard door thicknesses of 1¾" and 1¾" which will be further discussed hereafter.

[0015] The illustrated metal doorjamb is but one of two standard types. The second type is illustrated in FIGS. 11A and 11B and a difference will be noted in the prep opening 20. Again, the opening 20 has an inset configuration with screw or bolt openings 24 for securing a striker plate. The striker plate is different as required to fit opening 20 but the striker opening itself (both versions) accommodates a stan-
ard latch mechanism. This inset configuration, as is the prior inset configuration of FIGS. 10A and 10B, accommodates 1/3" and 1/3" door thicknesses. As in the version of 3A, the door plug 18 of FIG. 2 will not satisfactorily secure the door 10 to the metal frame 12.

FIGS. 2-9 provide detailed illustrations of a bushing 26 that solves the problem of the door plug not fitting the metal door frames. Illustrated is a preferred embodiment of a bushing 26 having a center hole or opening 28 that is configured similar to the shank portion 30 of door plug 18. For description purposes and with particular reference to FIGS. 4 and 5, the bushing is considered to have a center body portion 32, a first side protrusion 34, and an opposing second side protrusion 36. The body portion 32 has an exterior dimension a and b; the first side protrusion has an exterior dimension of c and d; and the opposing side protrusion has an exterior dimension of e and f.

It will be observed that opening 28 is off center from both protrusions, i.e., it is not centered on dimensions c of protrusion 34 or dimension e of protrusion 36. It is off center in both respects by 1/3", the purpose of which will be explained.

With reference to FIG. 3, it will be appreciated that the thickness dimensions accumulatively of the bushing 26, i.e., dimensions g, h, and l (see FIG. 8) is substantially the difference between the metal frame thickness and a typical wood frame thickness but as will also be apparent, this relationship need not be precise. The dimensions a and b enable the bushing to fit the width dimension of the metal jambs but also need not be precise, while dimension c-f, relative to opening 28 and to the striker prep openings 20, 20', need to be substantially precise.

Reference is now made to FIGS. 10A and 10B which illustrate bushing 26 with side 36 protruded into the striker prep opening 20 of metal frame 12X. The side protrusion 36 (FIG. 5) substantially fits the width and height of opening as defined by the width of 20 and the vertical distance between tabs 22. In FIG. 10A, the bushing is oriented to place the center line 38 of opening 28 in a rightward position, and in FIG. 10B the bushing is rotated in the plane of the drawing by 180° to place the center 38 in a leftward position. The position of the bushing in FIG. 10A accommodates a 1/3" width door and the position of the bushing in FIG. 10B accommodates a 1/3" width door.

FIGS. 11A and 11B illustrate a second of the typical metal door jamb types for which side 34 is designed. The side 34 protrudes through the striker prep opening 20 and fits that opening as indicated to provide the door plug opening 28 substantially precisely as required for receiving a door plug extended through the edge bore of a 1/3" width door. Again, rotation of bushing 26 and thereby side protrusion 34 by 180°, shifts the plug receiving opening from a rightward to a leftward position to accommodate the two standard wood door thicknesses, i.e., the center lines 38 of opening 28 is centered on the width of doors 40, 42 shown in dash lines.

A third type of metal frame being manufactured is similar to that of FIGS. 11A and 11B but has the holes 24 punched out of the metal with a peripheral shered extended rearwardly of the jamb 14 as viewed in FIG. 11A. Indentations 44 are provided in the bushing 26 to accommodate such shards.

It will thus be appreciated by those skilled in the art that the bushing 26 in combination with the door plug 18 now provides a simple and efficient securement device for securing in particular wood doors in metal frames. Whereas the bushings as disclosed above provide for securement of doors in four different relationships (two different prep opening types accommodating both 1/3" width and 1/3" width doors), it is contemplated that this multipurpose bushing can be provided as dual or even single use bushings, e.g., where only one type of metal frame is being secured by a securement device supplier.

The invention accordingly is believed to encompass the use of a bushing that seats into a striker prep opening of a metal frame to thereby provide a door plug receiving opening which in combination secures a door to a metal frame. The invention is accordingly intended to apply to securement devices that include the fasteners as defined in the claims appended hereto, which definitions are intended to have their broad meaning and is not limited to the specifics of the above described embodiments.

What is claimed is:

1. A bushing for use with a door plug for securing a door to a metal frame, said door including a face bore and edge bore and said frame including a configured striker prep opening that is oversized for the door plug, said door plug extending from the face bore into and through the edge bore and through the striker prep opening, said bushing comprising:

a body portion defining a through bore extended through said body portion from a front side to a second side of said body portion, and including a configured protrusion on at least one side, said configured protrusion mated to said striker prep opening for insertion into said striker prep opening and as inserted for securing the bushing against lateral movement of said bushing relative to said striker prep opening;

said through bore configured to receive the door plug as extended through the striker prep opening to secure the door plug against lateral movement whereby a retaining fastener on said door plug can be secured to the extension of said door plug to secure the frame to the door.

2. The bushing as defined in claim 1 wherein said configured protrusion and said through bore are in side-to-side offset relation and with the protrusion inserted into the striker prep opening provides a first position for said through bore and with the protrusion rotated 180° and inserted into the striker prep opening provides a second position for said through bore, said first and second positions accommodating different door thicknesses wherein the edge bore is centered in the door thickness.

3. A bushing as defined in claim 1 wherein the bushing is designed to accommodate a second metal frame type having a different configured striker prep opening, said bushing comprising:

a second configured protrusion on the opposing side of said body portion and mated to said striker prep opening of said second metal frame for insertion into said second striker prep opening and as inserted for securing the bushing against lateral movement of said bushing relative to said striker prep opening of said second metal frame, whereby the retaining fastener for said
door plug can be secured to the extension of said door plug to secure the frame to the door.

4. A bushing as defined in claim 3 wherein said second configured protrusion and said through bore are in side-to-side offset relation and with the second protrusion inserted into the striker prep opening providing a first and second position for said through bore and with the protrusion rotated 180° and inserted into the striker prep opening of said second frame providing a second position for said through bore, said first and second positions accommodating different door thicknesses wherein the edge bore is centered in the door thickness.

5. A method for securing doors in wood and metal door frames for shipping said doors and door frames to a building site for building installation, said doors secured by hinges at one side edge to the door frame and said doors and door frames prepped at an opposite side edge for latch mechanism which is to be installed at the building site; said method comprising:

   inserting a door plug through a prepped face bore and edge bore in said door and extended from the edge bore through a striker prep opening in the door frame and defining thereby an extended end portion of said door plug;

   for wood frames, said striker prep opening mated to the extended end portion of said door plug and securing said door plug to the frame and as secured preventing lateral movement of said door plug and door relative to the frame; and

   for metal frames having striking prep openings oversized relative to said extended end portion of said door plug, providing a bushing having a through bore mated to the extended end portion and a protrusion providing an edge portion surrounding said through bore and mated to said striker prep opening;

   inserting said protrusion into said striker prep opening and inserting said door plug extension into said through bore to secure said door against lateral movement relative to said frame and applying a fastener to the end extension of said door plug to thereby secure said door plug to said metal frame.

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