

United States Patent

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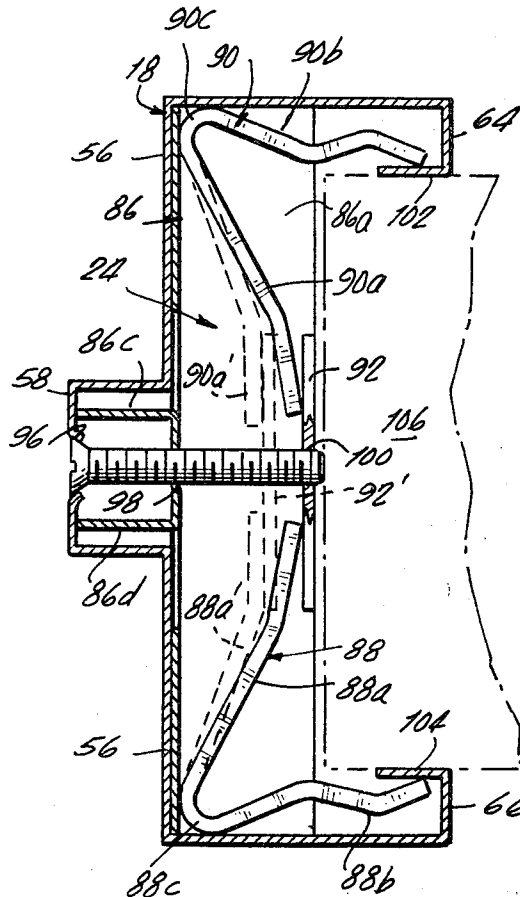
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[54] **STEEL DOOR FRAME**
7 Claims, 7 Drawing Figs.
[52] U.S. Cl. **52/217,**
49/504, 287/20.92 D, 287/189.36 H
[51] Int. Cl. **E06b 1/20**
[50] Field of Search **52/213,**
217, 211; 49/504

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ABSTRACT: A door frame assembly for installation around a passageway formed in an existing wall which includes a head frame and a pair of door jambs each door jamb being held in place by a pair of bottom anchors which engage the door jamb and are fastened to the outer surface of the surrounding walls and a clamping device positioned within each door jamb which may be adjusted to grip the adjacent wall surfaces.



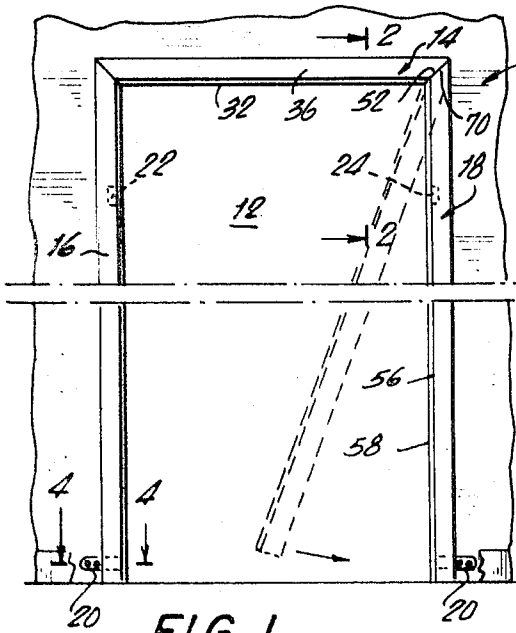


FIG. 1

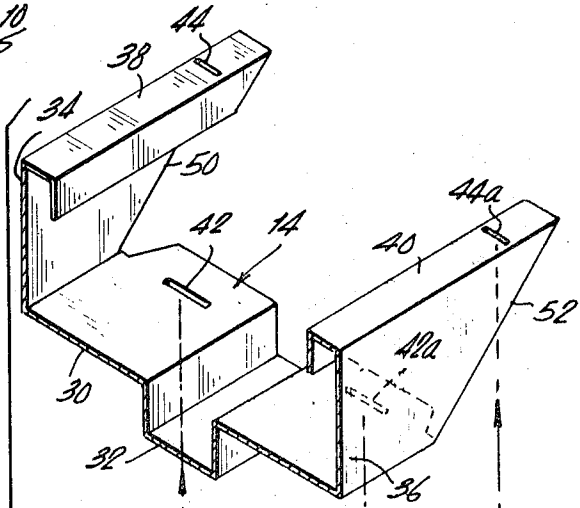


FIG. 2

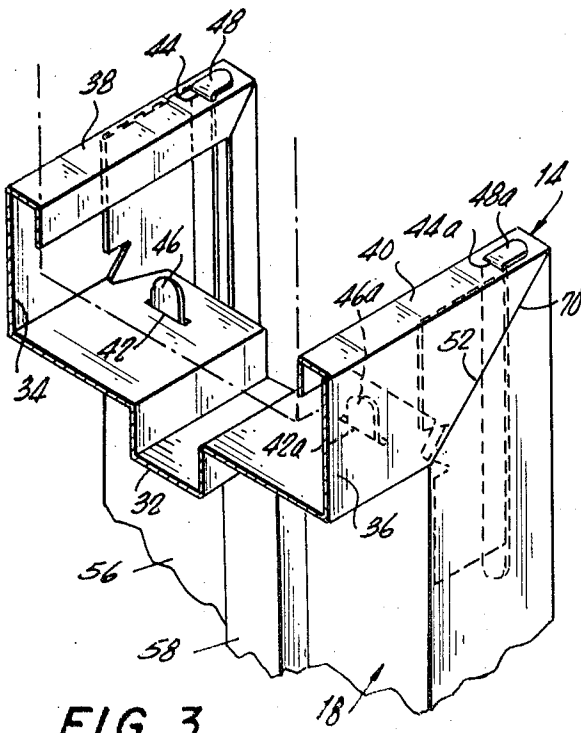
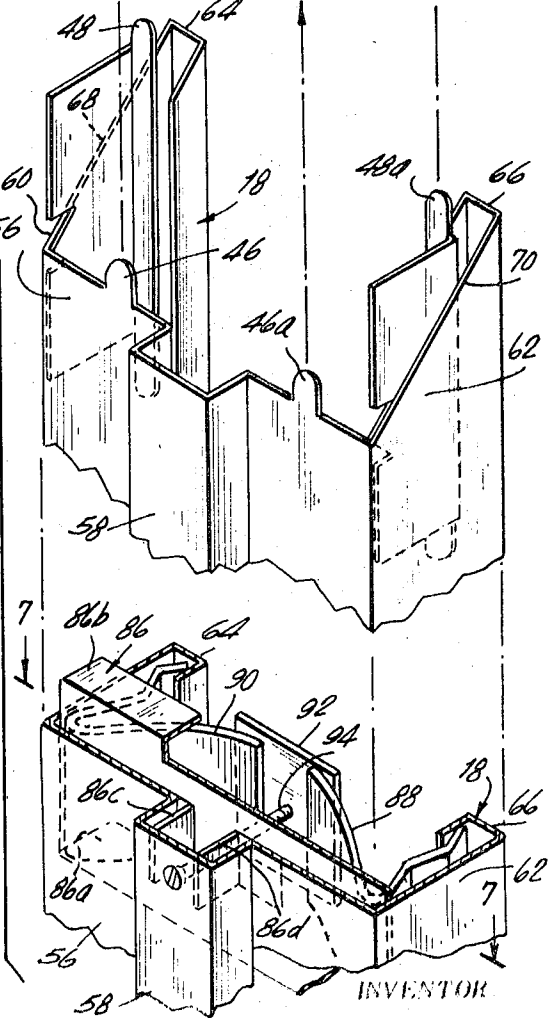


FIG. 3



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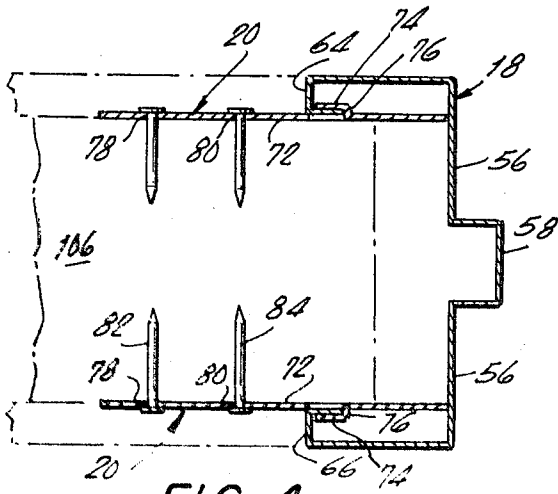


FIG. 4

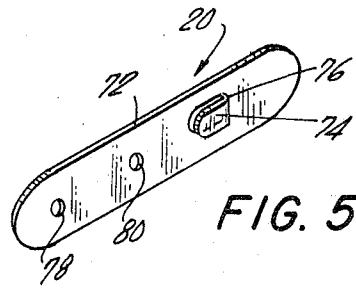


FIG. 5

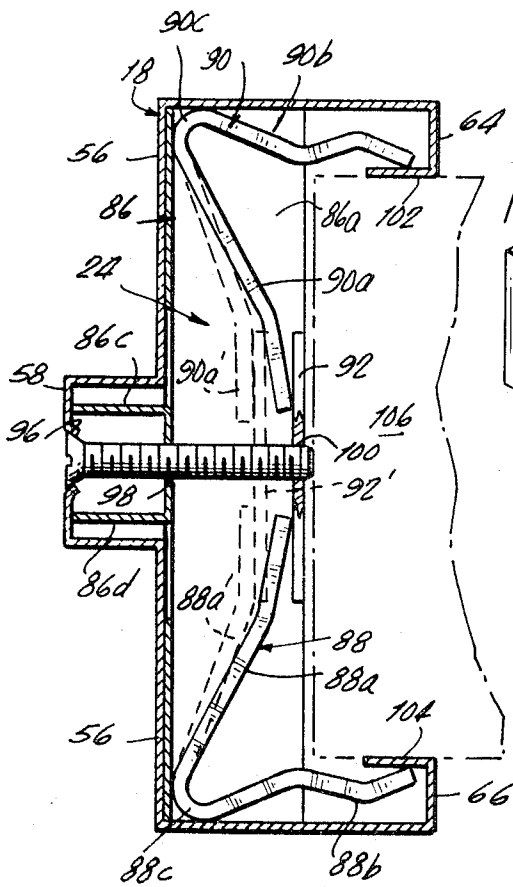
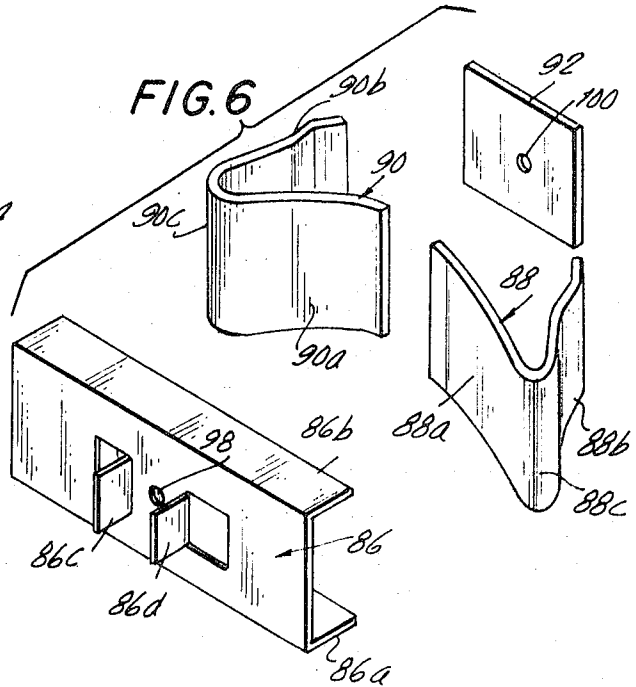


FIG. 7



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STEEL DOOR FRAME

The present invention relates generally to door frames for door passageways, and in particular to a prefabricated door frame assembly for use in doorways formed in existing walls.

Hollow metal door frames for defining a doorway are well known in the art. In a typical prior art structure the door jambs on either side of the doorway are held in place by a series of anchors or straps which extend perpendicularly into the wall structure surrounding the doorway. These anchors are fastened within the adjacent internal wall structure and serve to hold the door frame rigidly in place. Typically, the door frame is placed in position and the wall is built up around the frame with the anchors embedded in the wall.

The utilization of jamb anchors is not an entirely satisfactory way of attaching a door frame to a doorway since it requires access to the adjacent internal wall structure which may not be practiced or even feasible in some applications. This is particularly true where the intended doorway is not part of the original construction of a building and is to be cut into an existing solid wall. In such a situation it has generally been necessary to cut a passageway which is significantly larger than the intended final size of the doorway and then to build up the wall between the door frame and the old portions of the wall for the purpose of anchoring the door frame.

It is generally an object of the present invention to provide an improved metal door frame. Specifically, it is an object of the present invention to provide improved fastening means which does not require access to the interior wall structure adjacent to the intended doorway and which therefore eliminates the need to cut into the existing wall beyond the edges of the new door frame.

In accordance with an illustrative embodiment demonstrating objects and features of the present invention there is provided a metal door frame assembly for a passageway which comprises a header and spaced first and second door jambs cooperating to define a doorway. The door frame assembly may additionally be provided with external bottom anchoring means for the door jambs and internally mounted but externally operated clamping means for each door jamb. The anchoring and clamping means contemplated by the present invention cooperate to rigidly mount the door frame in the surrounding walls. Since the attachment of the frame to the wall may be accomplished without the use of internal jamb anchors the present invention makes it possible to form a door passageway which is pre-cut to the exact size of the desired doorway. Thus, by virtue of the present invention the need for cutting an enlarged door passageway which must be subsequently replastered and otherwise refinished is eliminated.

The above description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a presently preferred and illustrative embodiment of the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a front view of a door frame assembly embodying features of the present invention;

FIG. 2 is an exploded partial perspective view of the association between one end of the header, a door jamb and clamp means in accordance with invention;

FIG. 3 is a partial perspective view of the assembled header and door jamb;

FIG. 4 is a sectional view taken along the line 4-4 of FIG. 1;

FIG. 5 is a perspective view of a bottom anchor employed in a door frame in accordance with the invention;

FIG. 6 is an exploded perspective view of the components of the clamp means; and

FIG. 7 is a sectional view of the clamp taken along the line 7-7 of FIG. 2.

Referring now specifically to the drawings and in particular to FIG. 1, there is shown a typical door frame assembly generally designated as 10 which frames and surrounds a doorway 12. The door frame comprises a door header 14 and

door jambs 16 and 18. The lower portion of each door jamb may be equipped with a pair of anchor members 20, one on each side of the wall to which the door frame 10 is secured. Included within the upper structure of each door jamb is at least one clamp generally designated as 22 and 24 in FIG. 1.

Both the header and the door jambs are formed metal pieces which may be bent or formed from material such as cold rolled steel, bonderized steel, electrozinc coated bonderized steel or the like, or alternatively may be extruded into the desired shape. Header 14 is a generally channel-shaped continuous piece of formed metal comprising a lower section 30, having a rectangular channel 32 defining a door seat and first and second flange members 34 and 36. Flange members 34 and 36 terminate in lip members 38 and 40 which are formed by a pair of consecutive right angle bends in the portion of the header forming first and second flange portions 34 and 36. The header is formed with two pairs of slots 42, 42a, and 44, 44a at each of its respective ends, the slots being complementary with aligned tongue members 46, 46a, and 48, 48a which extend from each door jamb 16 and 18. The respective opposite ends of header 14 and particularly flange members 34 and 36 thereof, are cut at a 45° angle indicated by the numerals 50, 52 in FIG. 2 so as to mate with complimentary surfaces on each door jamb.

Each door jamb is comprised of a formed metal member which is similar in structure to the previously described header member. Thus, the door jamb comprises a generally channel-shaped member having an inward facing portion 56 which has a rectangular-shaped door seat 58 formed therein; first and second flange members 60, 62; and first and second lip members 64, 66 formed by successive right angle bends in first and second flange members. The door jambs are provided with complimentary mating surfaces 68, 70 cut at a 45° angle which abut the similarly cut surfaces 50, 52 of the header when the door frame is in the assembled condition. As previously described, the door jamb is provided with two pairs of tongue members 46, 46a, and 48, 48a which are inserted in complimentary slots provided in the header upon assembly of the door frame.

As best seen in FIGS. 1 and 3, the door jamb and header are assembled by swinging the jamb into position beneath the header utilizing the complimentary slots, and tongues as guide means. When the door jamb and header are assembled the tongues 46, 46a will be contained within header member 14 and will be beyond the reach of the workman installing the door frame. However, the tongue members 48, 48a will extend through lips 38, 40 which are exposed on either side of the doorway. These tongues are bent at right angles as shown in FIG. 3 in order to permanently connect the door jamb and header.

When the door jambs and header are assembled in accordance with the above described details, they will surround the doorway 12 and the material of the wall will extend into the space between the respective flange members. The permanent, rigid and secure connection of the door frame to the wall is accomplished by means of clamps 22, 24 and bottom anchor members 18.

A typical bottom anchor 20 is depicted in FIG. 5 and comprises a generally flat metal member 72 having a tongue 74 spaced from said metallic member 72 by a right angle bend 76. The combination of tongue 74 and right angle bend 76 forms a hook means which overlaps and interlocks with the lips 64, 66 of each door jamb. The bottom anchor is also provided with means for fastening the anchor to the walls adjacent to the doorway, for example holes 78, 80 adapted to receive nails 82, 84 which, when inserted, securely fasten the bottom of the door frame to the adjacent wall structure. After fastening the bottom anchors to the adjacent walls by means of nails, screws or other fastening devices, the anchors can be covered with molding or other decorative material to enhance the aesthetic effect of the completed doorway.

The door jambs will still not be securely and permanently attached to the adjacent walls after assemblage of the bottom

anchors to the adjacent wall structure since the frame is rigidly anchored only at the extreme lower ends by means of the bottom anchors. A rigid securement is accomplished by means of clamps 26 and 28. FIGS. 2, 6 and 7 depict the clamping structure 28 positioned within the door jamb 18, preferably at or above the midpoint of the door jamb. The clamping structure comprises a housing channel 86; a first tension clip 88 having a first arm 88a and a second arm 88b joined by bend 88c; a second tension clip 90 having a first arm 90a, second arm 90b and connecting bend 90c; and a face plate 92. Housing channel 86 is a channel shape member which by means of arms 86a and 86b houses tension clips 88 and 90 to restrain any longitudinal movement or slippage of the clips within the door jamb. The housing may additionally be provided with alignment guides 86c and 86d which aid in positioning the housing within the door jamb seat 58 and provide additional strength. The clamp is assembled by passing a screw 94 through hole 96 in the seat 58 of each door jamb and aligned holes 98 and 100 in the housing channel and face plate, respectively. As the screw 94 is turned the face plate 100 will move toward the position shown in outline in FIG. 7 as 92 thereby moving arms 88a, 90a, of tension clips 88 and 90 to the clamping position shown in outline as 88a', 90a'. The force exerted on these clips by the movement of face plate 100 is transmitted through bends 88c, 90c as well as arms 88b, 90b respectively thereby exerting a tension or clamping force in the vicinity of lips 64, 66 of each door jamb at the positions indicated as 102 and 104 respectively in FIG. 7. This clamping effect forces the lips 64 and 66 inward into gripping engagement with adjacent wall 106 thereby rigidly securing the door jamb to this adjacent wall structure.

The invention, will be understood by considering the following description of an installation of a door frame into a wall. In a typical case, an opening very slightly larger than the desired final size of the doorway is cut or formed in an existing wall structure. The frame head 14 is installed first and the door jambs 16 and 18 are slipped up into that head (as shown in outline in FIG. 1) utilizing the tongues 46, 46a, 48, 48a and the slots 42, 42a and 44, 44a as a guiding and securement means. The pairs of bottom anchors are snapped into the bottom of the door jamb by engagement of hook means 74, 76 of each anchor with the respective lips 62, 64 of each door jamb, and after insuring that the frame is plumb and square the bottom anchors are nailed or screwed into the base of the wall through the holes provided in the anchors. The screws 94 positioned in each door jamb are then tightened to produce the clamping action on the adjacent wall structure. The combination of the clamping action on each door jamb and the fasten-

ing of the anchors at the base of the jamb hold the frame rigidly in place.

It will be obvious to those persons skilled in the art that many modification may be made without departing from the spirit of the invention. For example, the door frame assembly could include additional clamp means in each door jamb and the externally mounted bottom anchors could be omitted. The true scope of the invention is defined in the appended claims.

What I claim is:

1. A door frame assembly for insertion into a surrounding wall comprising a door frame head and a pair of door jambs engaging said head to define a door frame, each of said door jambs comprising a channel-shaped member having an inward facing portion, a pair of opposing flange members and a pair of opposing lips, said opposing lips being formed from successive bends in said flange members and being spaced to receive the adjacent wall therebetween, removable clamp means mounted internally in each of said door jambs, said clamp means comprising a face plate, tension clip means and adjustment means, said tension clip means having a first portion abutting the interior surface of said inward facing portion of said door jamb, a second portion abutting said face plate and a third portion engaging said lips of said door jamb, said face plate being held in abutting relationship to said tension clip means by said adjustment means which joins said face plate and said door jamb whereby movement of said adjustment means causes said tension clip means to pivot about said interior surface of said inward facing portion and to urge said lips inward toward each other and grip said wall.
2. The assembly of claim 1 wherein said clamp means includes a pair of tension clips.
3. The assembly of claim 1 wherein said adjustment means comprises a screw which passes through aligned holes in said face plate and said door jamb.
4. The assembly of claim 1 wherein a housing for said tension clip means is interposed between said first portion of said tension clip means and said interior surface of said inward facing portion of said door jamb and said first portion of said tension clip means abuts and pivots about the interior surface of said housing.
5. The assembly of claim 4 wherein each of said door jambs is further secured to said adjacent wall by anchor means.
6. The assembly of claim 5 wherein said anchor means comprises hook means engaging the lip of said door jamb and fastening means for connecting said anchor means to said adjacent walls.
7. The assembly of claim 5 wherein said anchor means engages said door jamb below the midpoint thereof.

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