

- [54] COMBINATION SCREW ALIGNING AND FRAME REINFORCING BRACE
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- [52] U.S. Cl. **52/213; 52/211; 52/716**
- [51] Int. Cl.² **E06B 1/12**
- [58] Field of Search **52/211, 212, 213, 217, 52/716, 682; 49/504, 505**

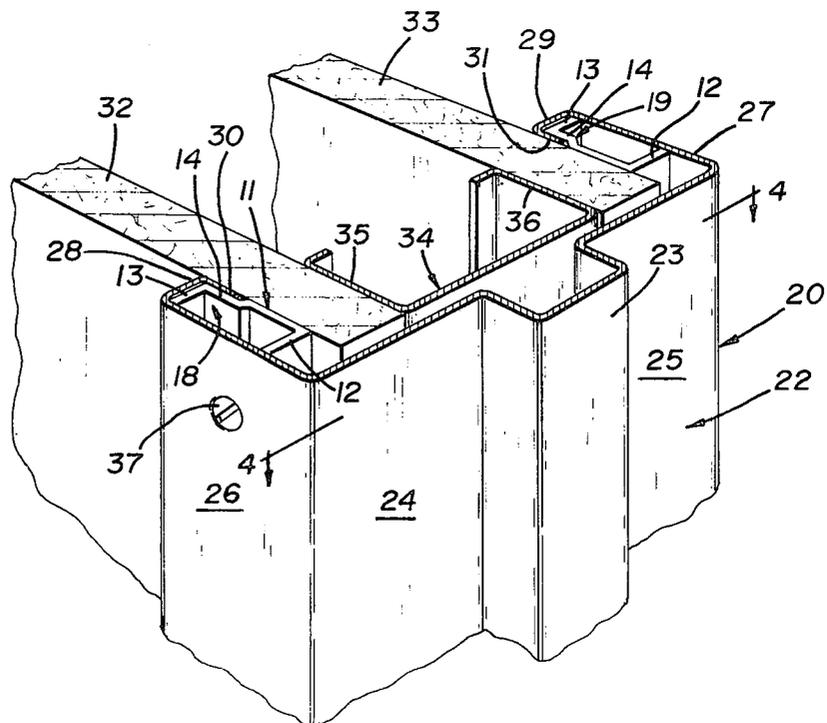
- [56] **References Cited**
- UNITED STATES PATENTS**
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|-----------|---------|----------------------|----------|
| 1,593,734 | 7/1926 | Voight | 52/682 |
| 3,007,559 | 11/1961 | Goldberg | 52/211 X |
| 3,469,360 | 9/1969 | Peterson et al. | 52/665 X |

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[57] **ABSTRACT**

A quickly assembled door frame having frame members formed of metal channel including spaced-apart legs each terminating in flanged means forming a U-shaped portion defining a recess, and at least one U-shaped brace mounted in each recess having a major web and a pair of parallel spaced-apart flanges extending therefrom, the ends of the flanges of said brace engaging the inner surface of each leg of the door frame, the web of the brace having an offset portion positioned within the recess of the U-shaped portion of the legs of the door frame and having an aperture provided therein to receive and guide a fastening means extending through an aperture provided in the legs of the door frame. In an improved embodiment, a recess such as an aperture or a depression is provided in the offset portion of the brace adapted to engage a protuberance or a nubbin provided in the terminal flange of the leg, thereby restraining the brace within the U-shaped portions of the legs of the door frame.

.11 Claims, 4 Drawing Figures



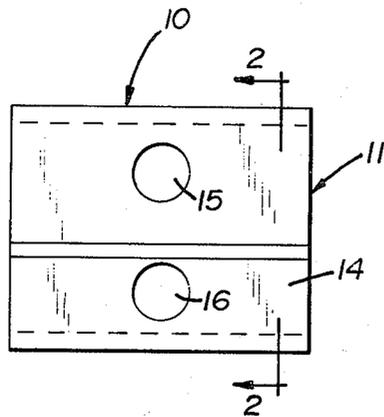


Fig. 1

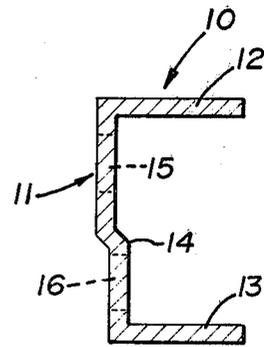


Fig. 2

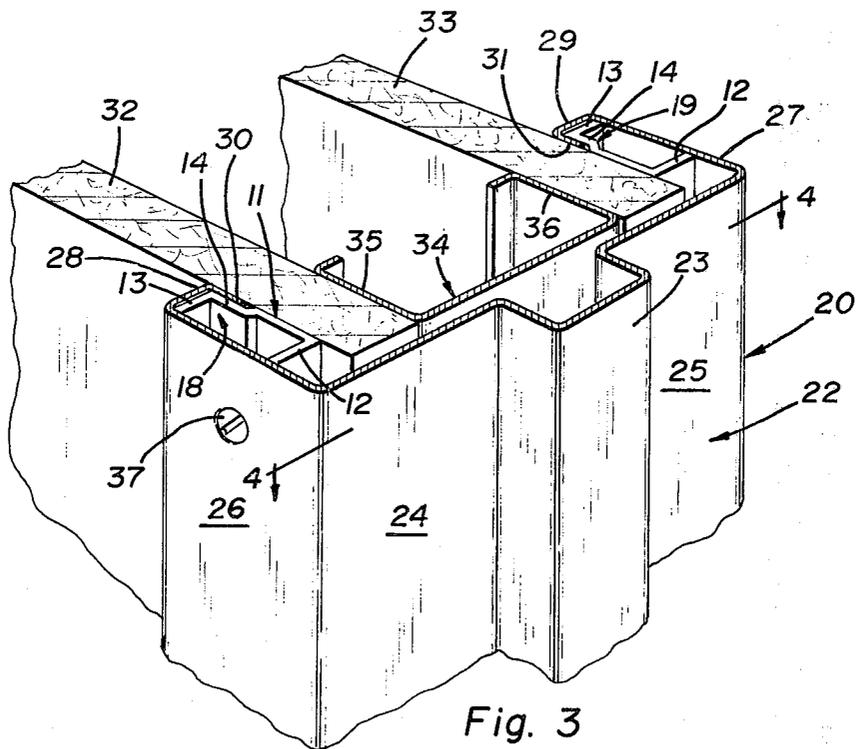


Fig. 3

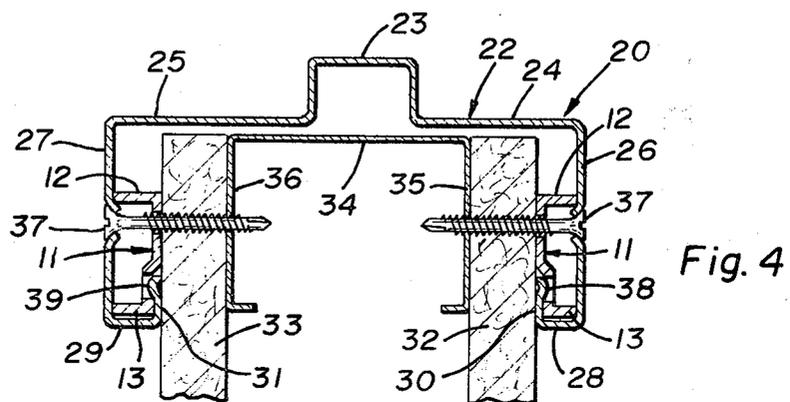


Fig. 4

COMBINATION SCREW ALIGNING AND FRAME REINFORCING BRACE

BACKGROUND OF THE INVENTION

1. Field of Invention

The present invention relates to door frames, and is more particularly concerned with a quickly assembled door frame having improved means for fastening the door frame to a wall structure.

2. Prior Art

Door frames which may be quickly assembled are known in the art. Door frames of this type are disclosed in U.S. Pat. No. 3,469,360 and are formed of sheet metal and of channel-form construction. Such frames are designed to be applied over drywall constructions. Such structures generally are provided with legs terminating in U-shaped portions defining recesses, and maintaining the legs of the frame spaced apart from the wall. Consequently, when fastening means such as nails or screws are applied through apertures provided in the legs of the frame and nailed into the wall, there is a tendency of the relatively thin wall of the frame to become distorted if the fastening means is driven in too far. In the patent referred to, brackets are welded to the door frame to serve as a backing. However, brackets requiring welding may be difficult to mount in close spaces and in addition do not provide sufficient restraint to prevent the frame wall from buckling when too much force is applied in driving in the fastening means.

SUMMARY OF THE INVENTION

It is accordingly an object of the present invention to provide a door frame assembly which is readily constructed and mounted.

It is another object of the invention to provide a door frame having means for providing support for the sidewalls of the frame when inserting an affixing fastening means and driving the fastening means into the supporting wall.

It is a further object to provide fastening means support which may be readily mounted on the door frame.

It is another object to provide a fastening means support for a door frame which guides the fastening means in proper position when the fastening means is driven into the supporting wall.

It is a further object to provide fastening means support which may be so inserted that it stays in place in the door frame, facilitating the subsequent affixing fastening means.

It is still an additional object to provide a supporting structure of the type described which may be readily and inexpensively fabricated from commonly available materials.

It is still another object to provide a supporting means which may be utilized with existing door frame structures.

Still other objects and advantages will readily present themselves to one skilled in the art upon reference to the following specification, the drawing, and the claims.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing,

FIG. 1 is a side elevational view of a door frame reinforcing brace according to the invention;

FIG. 2 is a cross-sectional view of the brace taken at the line 2—2, looking in the direction of the arrows;

FIG. 3 is a fragmentary perspective view showing a portion of a door frame having reinforcing braces according to the invention, and mounted on a wall, and

FIG. 4 is a cross-sectional view taken at the line 4—4 of FIG. 3, looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawing and particularly FIGS. 1 and 2, a brace 10 is shown comprising a web 11 and a pair of substantially parallel spaced-apart flanges 12 and 13. The web 11 is provided with an offset portion 14. A guide aperture 15 adapted to receive and guide a fastener such as a nail or screw is provided in the web 11. A detent aperture 16 is provided in the offset portion 14. The brace may be manufactured or fabricated of any suitable material such as sheet metal, extruded aluminum, die cast metal, but is preferably fabricated of steel.

Referring to FIGS. 3 and 4, a fragmentary portion of a door frame and wall assembly is shown comprising a door frame 20 which may be a strike jamb, hinge jamb, or header. The door frame is substantially channel-form and comprises a major web 22 having a stop rib 23 provided in the center thereof, dividing the web 22 into web members 24 and 25. The door frame 20 also has sidewalls 26 and 27 connected to flanges 28 and 29 directed inwardly and terminating in flange legs 30 and 31, respectively. The sidewall 26, the flange 28, and the flange leg 30 cooperate to define a channel-form recess 18, and the sidewall 27, the flange 29 and the flange leg 31 cooperate to define a channel-form recess 19.

Disposed within the door frame 20 are a pair of wall boards 32 and 33 in engagement with the flange legs 30 and 31, respectively. A stud or runner track 34 has sidewalls 35 and 36 engaging the inner walls of the wallboards 32 and 33, respectively. Screws 37 pass through apertures in the sidewalls 26 and 27, through the guide apertures 15, through the wall boards 32 and 33 and engage the sidewalls 35 and 36, respectively, of the stud 34. Protuberances or nubbins 38 and 39 are provided in the flange legs 30 and 31, respectively, for engaging the detent apertures 16 of the braces 10, thereby maintaining the braces in position.

In preparing the door frame members for mounting, a plurality of braces 10 are inserted in the recesses 18 and 19 wherever a fastener such as a nail or screw is to be inserted. The offset portion 14 of each brace is so designed in combination with the flange 13 that it can be received into the recesses 18 and 19. The protuberances engage the detent apertures and restrain the braces in place. The door frame member 20 then is slid over the wall structure into the position shown in FIGS. 3 and 4. Fastening means such as screws 37 are then inserted into the apertures provided in the sidewalls 26 and 27 of the door frame member and through the guide apertures 15. The guide apertures direct the screws as they are driven through the wall board 32 and 33 and maintains the screws in a straight direction. The screws then engage the sidewalls 35 and 36 of the stud 34 and, as they are self-tapping, threadedly engage the apertures in the sidewalls. As the screws 37 are tightened into place, the flanges 12 and 13 of the brace 10 engage the sidewalls 26 and 27 of the door frame and support them so that the walls are not deformed by excess screw force. There is thus provided a very strong and precise engagement of the door frame with the wall, while the sidewalls of the door frame are sup-

ported so they do not become distorted or deformed.

The brace of the present invention when used with quick fitting or quick installing door frames has many advantages over devices disclosed in the prior art. First, the brace is very simple and inexpensive to form, and may be produced from stock materials readily available on the market. The brace provides excellent support for the sidewalls of the door frame and prevents any distortion or deformity of the sidewalls when the fastening means such as screws are tightened into place. The braces are provided with an offset portion to fit into the recess provided in the sides of the door frame. The recesses are so designed and proportioned that they permit the offset portions to be received within the recesses in such manner that the non-offset surface of the brace is flush with the flange leg outer surface of the door frame. Further, cooperating detent means and detent engaging means are provided in the flange legs of the door frame and in the offset portions of the brace so that the brace is restrained in place after it is properly inserted. This avoids the need for costly spot welding such as required by some structures of the prior art. The brace has a further advantage in that it is provided with a guide aperture for the fastener such as a nail or screw which guides the fastener through the wall board and into the stud of the wall structure in proper perpendicular orientation. The structure of the invention may be utilized with either wood stud structures or metal stud structures. The brace may be utilized in mounting strike jambs, hinge jambs, or headers and serve similar functions in each type of mounting. Further the presence of the brace increases the contact area for improved gripping between the frame and the wall structure.

With the development of the present brace, it is no longer necessary to use spot welding of supporting structures, such as disclosed in the patent referred to above. Spot welding has a further drawback in that it cannot be used with pre-decorated materials. Through the use of the present brace which does not require spot welding to retain it in the frame structure, pre-decorated materials may be utilized, and this has opened the use of quick-mounting door frames to entirely new markets of pre-decorated materials. Additionally, the development of the present brace has permitted the quick-mounting door frame to be utilized with metal studs.

The brace which is the subject matter of the present invention has several functions. First, it serves as a reinforcement structure. When the brace is snapped into position and maintained in position by the detent and detent engaging structure, the bracket provides support for a fastener such as a nail or screw. When the present bracket is not utilized in a light free standing frame, slight movement at the frame base is experienced. The use of the brace permits the use of "free-standing" frames. Such structures have hinges attached directly to the light gauge steel trim frame. When anchor means such as the strap type anchors disclosed in the above referred to patent are used, a slight movement of the frame at the floor line occurs with time. With utilization of the present reinforcing brace this movement is completely eliminated. The present brace has a further advantage, as pointed out, that it may be used in combination with both wood stud and steel stud construction, and, additionally provides a means to guide the fastener such as a nail or screw perpendicular to the frame face and into the stud wall construction. This is particularly

important since without such guidance of the brace, the nail or screw could easily be misdirected and miss the metal components of the stud system completely.

Although the protuberance or detent has been shown as provided in the flange leg and the detent recess or aperture provided in the brace, the structures could be reversed and the protuberance or detent provided in the brace and the detent recess or aperture provided in the flange leg.

It is to be understood that the invention is not to be limited to the exact details of operation or structure shown and described in the specification and drawing, since obvious modifications and equivalents will be readily apparent to one skilled in the art.

We claim:

1. An integral combination fastener alignment and frame reinforcing brace adapted to be utilized with a quickly assembled door frame formed of a plurality of members each generally channel-shaped in cross-section and having a flange defining a channel-form recess therewith provided for receiving said brace, said brace being generally U-shaped and comprising a main web formed solely of two planar portions consisting of a first portion and an offset portion offset at a line substantially transverse with respect to said main web and lying in a plane substantially parallel to that of said first portion, a pair of spaced-apart substantially parallel planar flanges connected one to the end of and substantially perpendicular to said first portion and the other to the end of and substantially perpendicular to said offset portion, said main web having a fastener-aligning aperture provided therein and said offset portion having detent means provided therein, whereby said offset portion of said main web is adapted to be inserted into the channel form recess of said door frame and retained therein by said detent means, and the outer surface of said first main web portion is adapted to be positioned substantially flush with the outer surface of the flange of said door frame defining said recess.

2. A brace according to claim 1, fabricated of metal.

3. A brace according to claim 1, fabricated of steel.

4. A brace according to claim 1, wherein said offset portion has detent means provided therein complementary with detent means provided in said door frame member.

5. A brace according to claim 4, wherein said detent means is an aperture.

6. In combination:

A. a quickly assembled door frame formed of a plurality of frame members of generally channel-form cross-section, each of said frame members comprising:

1. a frame face, and

2. a pair of spaced-apart sidewalls, each of said sidewalls comprising:

a. an inwardly directed flange, and

b. a flange leg, each of said sidewalls cooperating with an inwardly directed flange and a flange leg to define a recess, and

B. a combination fastener alignment and frame reinforcing brace being generally U-shaped and comprising a main web having a pair of spaced-apart flanges perpendicular thereto, a portion of said main web being offset and the other portion of said main web having a fastener alignment aperture provided therein, said brace being mounted in said frame with said offset portion disposed in the channel formed by said sidewall, said inwardly directed

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flange, and said flange leg, the ends of the flanges of said brace engaging the sidewall of said frame member, and complementary detent means provided in the offset portion of said brace and in the flange leg of said frame retaining said brace within said recess.

7. The combination according to claim 6, wherein said complementary detent means comprise a protuberance provided on said flange leg an aperture provided on said offset portion of said brace receiving said protuberance.

8. The combination according to claim 6, wherein the portion of the outer surface of the main web of said

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brace is substantially flush with the outer surface of said door frame sidewall flange leg and wherein the outer surface of the offset portion of said brace engages the inner surface of said flange leg.

9. The combination according to claim 6, wherein the fastener alignment aperture of said brace is aligned with an aperture provided in a sidewall of said frame member.

10. The combination according to claim 6, wherein said brace is fabricated of metal.

11. The combination according to claim 6, wherein said brace is fabricated of steel.

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