Feb. 23, 1960 K. L. LEE, JR., ET AL 2,925,894

DOOR FRAME

Filed Dec. 27, 1956

Fig. 1

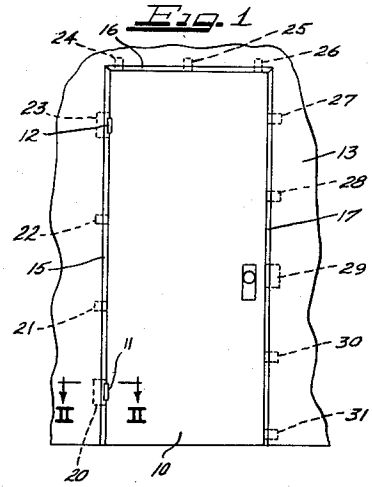


Fig. 3

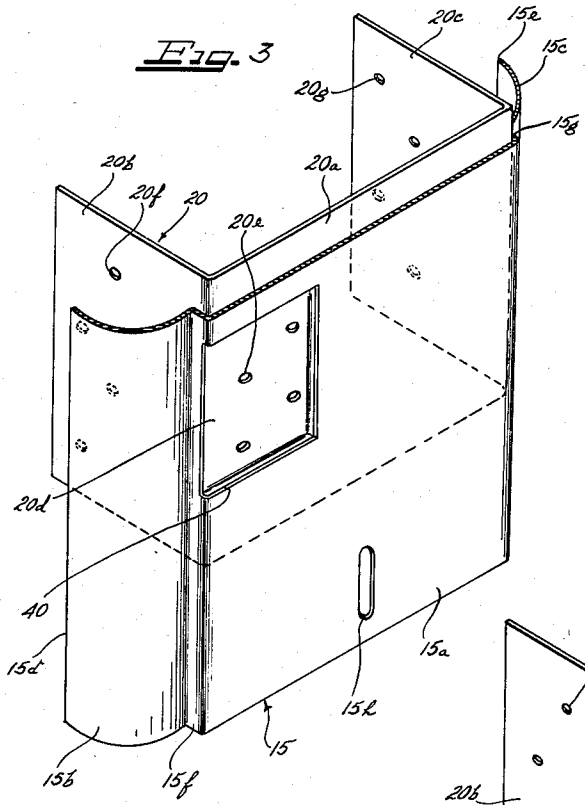


Fig. 4

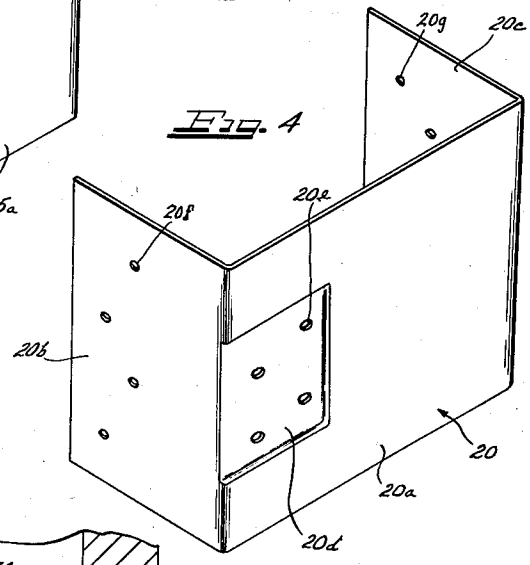
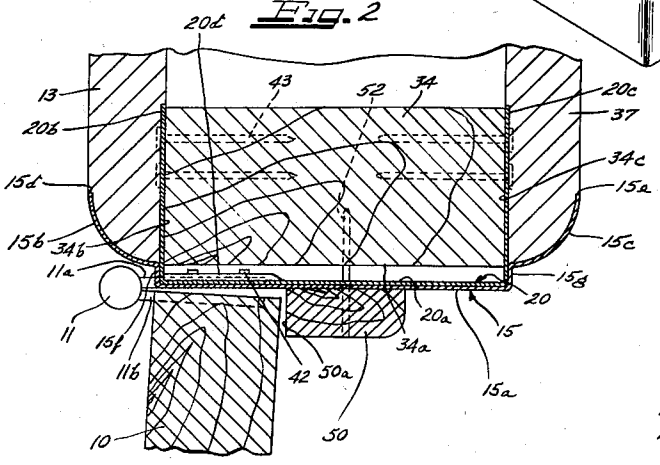


Fig. 2



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DOOR FRAME

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3 Claims. (Cl. 189—46)

This invention relates to a structure for providing a decorative and functional finish to wall openings and particularly to a door frame structure comprising a door frame or casing of thin sheet configuration.

In a preferred embodiment of a door frame structure in accordance with the present invention a thin sheet metal door frame section providing a finishing edge for a plaster wall is mounted on the wooden studding adjacent a doorway by means of a rigid saddle of heavy metal construction. The door hinges are secured directly to the heavy metal saddle by metal screws to provide a mounting capable of with standing the tremendous stresses exerted by the weight of the door, particularly at the upper hinge. The stresses set up in use of the door are transmitted by the saddle to the wooden studding by means of nails or other fastening means extending into the studding in a direction generally at right angles to the direction of action of said stresses so as to absorb the stresses in shear. By the use of metal screws, a saddle of heavy metal construction and nails in shear to transmit the stresses exerted by the door to the wooden studding, a very rigid mounting is achieved which prevents vibration of the door frame and thus insures that the plaster walls associated with the door frame will not be cracked in use of the door.

The door frame marginal edges which provide a finish for the plaster wall are preferably freely flexible relative to the central portion of the door frame which is secured to the saddle so as to further effectively prevent transmission of stresses resulting from use of the door to the plaster wall. In effect the sheet metal door frame edges are in floating relation to the rigid chain of stress transmitting elements between the door and the wooden studding.

The heavy metal saddle preferably has attachment arms extending generally at right angles to the hinge receiving body portion thereof for embracing the sides of the wooden studding in universally shiftable relation to provide angular and rectilinear adjustment of the door frame in the plane of the doorway. The saddle thus greatly facilitates mounting of the door since the saddle itself accommodates angular adjustment of the door frame structure in plumbing the door-receiving face thereof and accommodate rectilinear adjustment of the door frame structure in accordance with the size and configuration of the door to be mounted thereon.

The preferred door frame structure in accordance with the present invention further comprises in conjunction with the thin sheet metal door frame section, a wooden door stop strip disposed centrally along the door frame section and secured directly to the wooden studding by means of fastening means such as nails extending through apertures in the door frame section. The wooden door stop strip is of great importance in conjunction with the metal door frame section since the wooden strip may be readily adjusted after installation of the door frame structure in case the door becomes warped. Further the wooden door strip may be bowed to provide

the desired lateral tension on the latch bolt and thus prevent rattling of the door in closed position thereof. It is found also that the wooden door strip provides a very advantageous sound deadening function and avoids the metallic sound associated with prior art metal door frames. Further, the wooden strip readily accommodates adjustment to different size doors.

It is therefore an important object of the present invention to provide a door frame structure which is particularly constructed to prevent cracking of plaster walls in use of the door mounted thereby.

A further important object of the present invention is to provide a door frame structure which provides an extremely rigid mounting for a door and yet which readily accommodates angular and rectilinear adjustment relative to the wooden studding during installation.

Another important object of the present invention is to provide a metal door frame structure capable of convenient alteration to accommodate warped doors or doors of different thickness and which avoids the metallic sound normally associated with closure of a door against a metal door frame.

Other objects, features and advantages of the present invention will be apparent from the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a fragmentary somewhat diagrammatic side elevational view illustrating the structure of the present invention as applied to a doorway;

Figure 2 is a fragmentary enlarged horizontal sectional view taken generally along the line II—II of Figure 1;

Figure 3 is a fragmentary enlarged perspective view illustrating portions of a door frame structure in accordance with the present invention; and

Figure 4 is a perspective view illustrating the mounting means of the door frame structure of Figure 3.

As shown on the drawings:

The present invention is particularly adapted to use in providing a decorative and functional finish to a doorway and for mounting a door therein. In this case, as illustrated in Figure 1, a door **10** is to be mounted by means of hinges such as indicated **11** and **12** to provide a closure for a doorway or opening in a side wall **13**. Figure 1 illustrates door frame sections **15**, **16** and **17** supported by mounting means **20**—**31** at opposite sides and at the top of the doorway. The mounting means **20** and **23** are adapted to rigidly mount the hinges **11** and **12** for the door **10**, while mounting means **29** may carry a strike plate or the like (not shown).

The mounting means **20**—**31** are secured directly and rigidly to the structural framework surrounding the doorway which may include an upright wooden stud **34** as indicated in Figure 2. The term "jamb" will be used herein to designate the upright structural framing for the doorway, whatever its construction or composition, but preferably such jamb structure will provide a vertical end face such as indicated at **34***a* and planar side attachment faces such as indicated at **34***b* and **34***c* in Figure 2.

As seen in Figure 3, the door frame structure preferably comprises elongated sections of sheet material such as indicated at **15** having generally U-shaped brackets such as **20** secured thereto. The thickness of the section **15** has been exaggerated in Figure 3 for ease of illustration and is preferably relatively thin in comparison to the mounting means **20**. By way of example, the door frame section **15** may be of thin sheet metal and may have a generally channel-shaped cross section configuration including an intermediate generally planar web portion **15***a* of width and height generally corresponding to the width and height of the end face **34***a* of the jamb **34** and curved marginal edge portions **15***b* and **15***c* terminating in edges **15***d* and **15***e* which provide finishing edges

for the walls on opposite sides of the doorway such as indicated at 13 and 37 in Figure 2. The specific configuration of the door frame or casing 15 will of course vary with the nature of the walls at the respective sides of the doorway, and the margin portions 15*b* and 15*c* particularly may have any desired configuration.

The mounting means 20—31 may be of generally similar construction and may comprise intermediate body portions such as indicated at 20*a* in Figures 3 and 4 of substantially planar configuration and angularly related body portions such as indicated at 20*b* and 20*c*. As seen in Figure 3 the intermediate body portion 20*a* is preferably coextensive with the width dimension of the web portion 15*a* of the door frame and fits snugly against the interior surface of the web portion to which it is preferably secured at the time of manufacture as by welding. If desired, the door frame may have inturned portions 15*f* and 15*g* at opposite sides of the web portion 15*a* which snugly embrace the opposite side surfaces of the mounting means 20 as seen in Figure 3.

For supporting the door 10 directly from the relatively rigid mounting means 20, the door frame section 15 is cut away as indicated at 40 in Figure 3 and the web portion 20*a* of the mounting means 20 is recessed as indicated at 20*d* in Figure 4 to receive the hinge leaf 11*a* with its outer surface flush with the outer face of the web portion 15*a* as indicated in Figure 2. For securing the hinge leaf 11*a* to the mounting means 20, the recessed portion 20*d* of the mounting means is provided with screw retaining apertures 20*e* which may be threaded or otherwise constructed to retain suitable fastening elements such as machine screws 42 indicated in Figure 2. The screw retaining apertures 20*e* are preferably formed in locations in recessed portion 20*d* of bracket 20 in exact correspondence with the apertures in hinges 11 and 12 during manufacture of the door frame structure. The door 10 may be recessed to receive the hinge leaf 11*b* as indicated in Figure 2 so that the inner edge face of the door 10 may lie flush with the exterior surface of the web portion 15*a* of the door frame if so desired.

As seen in Figure 2, the angularly related body portions 20*b* and 20*c* of the mounting means or saddle 20 are spaced and disposed so as to be engageable with the opposite side faces 34*b* and 34*c* of the jamb 34 in universally slidable relation during mounting of the door frame on the jamb. Thus, in mounting the door structure, the door frame structure may be mounted on the jamb 34 and be angularly and rectilinearly adjusted in the doorway so that web portion 15*a* is exactly plumb and is at the desired location vertically and laterally of the doorway. When this disposition of the door frame is achieved, suitable fastening means such as nails 43 may be driven through apertures such as 20*f* and 20*g* in the saddle member 20 and into the side attachment faces 34*b* and 34*c* of the jamb 34. The door is thereafter readily mounted by means of the hinges 11 and 12 as indicated in Figure 1.

It will be understood that stresses exerted on the door frame structure at the upper and lower hinges due to the weight of the door 10 are rigidly transmitted to the saddle members 20 and 23 by means of machine screws such as indicated at 42 in Figure 2 which provide a rigid metal to metal connection between the hinges and the saddle members. The stresses are transmitted by the heavy saddle members to nails such as indicated at 43 in Figure 2 which extend generally at right angles to the direction of the stresses and which are thus effective to rigidly absorb the stresses in shear. It has been found that this rigid chain of stress transmitting elements including the metal screws 42, the heavy metal saddle members 20 and 23 and the nails 43 in shear, effectively prevents jarring of the door frame structure in use of the door and thus prevents cracking of the plaster walls associated with the door frame.

To complete the assembly, wooden door stop strips such as indicated at 50 in Figure 2 are adjusted in the desired relation to the adjacent face of the door 10 and are secured in place generally centrally of the web portion 15*a* by suitable fastening means such as nails 52 extending through relatively large apertures such as indicated at 15*h* in Figure 3, the fastening means 52 being secured in the end face 34*a* of the jamb 34. The apertures 15*h* are of sufficient lateral extent to accommodate precise adjustment of the edge 50*a* in relation to the door 10. It is found that the use of a wooden strip 50 as illustrated in Figure 2 is a very substantial improvement over the use of a metal door stop with a metal door frame. A very important advantage of this construction resides in the fact that if the door becomes warped, the door strip 50 may be adjusted to accommodate the warpage in a very simple manner. Further, the strip 50 may be bowed slightly so that the upper and lower ends thereof engage the door to require a slightly corresponding bowing of the door during closure thereof. By this means, rattling of the door in closed position is effectively prevented. The strip 50 may be adjusted to doors of varying width at the time of installation to give a much greater flexibility to the door frame structure of the present invention; further, it has been found that the wooden door strip has a very important sound deadening function and prevents the metallic sound normally associated with closure of a door against a metal door frame. Since the door stop is not an integral part of the metal door frame but is secured directly to the wooden jamb independently of the door frame, the door stop will absorb the impact associated with door closure without transmitting any vibration to the metal door frame.

It will be apparent that many modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

We claim as our invention:

1. In a door frame for attachment to a door jamb at a doorway, an elongated frame section of sheet configuration for mounting along said door jamb to provide a finish piece at a margin of the doorway, mounting means for said frame section comprising a pair of U-shaped angle brackets secured to said frame section adjacent opposite ends thereof, each angle bracket being of relatively rigid metal material substantially more rigid than said frame section and having an intermediate body portion secured to the inner side of said frame section and having angularly related body portions extending laterally of said intermediate body portion for overlying respective opposite side face portions of said jamb in shiftable relation thereto during mounting of said frame section, said frame section having a cut-away portion overlying said intermediate body portion of each angle bracket, said intermediate body portion of each angle bracket having screw retaining apertures therein in alignment with said cut-away portion of said frame section, and a door hinge for disposition in said frame section cut-away portion associated with each angle bracket and having apertures therein in exact correspondence with said screw retaining apertures for accommodating rigid attachment of said hinge to the angle bracket.

2. A door jamb assembly comprising a jamb of rigid material having an end face defining a margin of a door opening and having side attachment faces at each side of said end face and extending generally at right angles thereto with a fixed predetermined separation therebetween, a door frame section of relatively thin sheet material and of generally channel shape comprising a generally planar web portion of width and height generally corresponding to the width and height of said end face of said jamb member at said door opening for providing a finishing cover for said end face and comprising marginal edge portions for providing finishing edges for wall surfaces covering the respective side attachment

faces of said upright jamb member, a pair of U-shaped angle brackets of rigid metal material substantially more rigid than said sheet material of said door frame section secured to the inner side of said door frame section adjacent the respective opposite ends thereof and each comprising a generally planar intermediate body portion in conforming contacting engagement with said planar web portion of said door frame section and end body portions extending generally at right angles to said intermediate body portion into overlying parallel relationship to said side attachment faces of said jamb, means securing said end body portions of said angle brackets to said side attachment faces of said jamb with said door frame section in precise vertical disposition, said planar web portion of said door frame section being cut away and said intermediate body portions of said angle brackets being indented inwardly to define hinge receiving recesses, said intermediate body portions having screw retaining apertures therein at said hinge receiving recesses, hinge members disposed in said hinge receiving recesses and having screws securing said hinge members in said recesses with the outer face of said hinge members flush with the outer face of said planar web portion of said door frame section, a door stop of elongated strip material having sound deadening properties extending along the length of said door frame section centrally of the planar web portion thereof, and fastening means secured to said door stop at spaced intervals therealong and extending through said door frame and into anchoring relation to said end face of said jamb.

3. In a door frame structure for attachment to a door jamb at a doorway, an elongated door frame section of non-wood sheet material for mounting along said door jamb to provide a finish piece covering said jamb at a margin of the doorway, means for mounting said frame section in overlying covering relation to said door jamb, a separate wooden door stop strip overlying a central portion of the length of said frame section in contacting relation thereto, said frame section having aperture means underneath said wooden door stop strip, and fastening elements for extending through said wooden door stop strip and through said aperture means and into rigid engagement with said door jamb, said aperture means being of substantially greater lateral extent than the cross sectional dimension of the fastening means to accommodate adjustment of said wooden door stop strip laterally relative to said door frame section, and said door stop strip thereby being mounted substantially independently of said door frame section and transmitting door closure forces directly to said door jamb without substantially disturbing said door frame section.

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