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[54] **QUICK INSTALLATION DOOR FRAME AND METHOD**

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[51] **Int. Cl.** **E06b 1/04**

[58] **Field of Search** ..49/504, 505, 400, 401; 52/211, 52/213, 127

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[57] **ABSTRACT**

A quick-installation metal door frame for mounting a door between upright cripples. Hinge and strike frame sides are joined at their upper ends to a horizontal header by means of an overlapping, nesting miter joint. The hinge and strike plates are mounted in depressions formed in frame sides, and fastener means extend into the associated cripples through recessed holes formed in the depressions so that the hinges or strike plate trap the fastener means concealing them from view. The frame sides are thus secured to the cripples so as to provide an assembled door frame which is properly aligned, even though the cripples may be out of plumb. Bendable tabs are formed at the lower ends of the hinge and strike frame sides in a manner affording simplified attachment to a wall structure, with the tabs concealed from view by the abutting wall base member or rug. Tab slots provide a range of vertical adjustment for the frame sides without the necessity of removing the tab fasteners. A protective layer is secured to the outer surface of the header, hinge and strike frame sides, and this layer is adapted for removal after assembly of the door frame to expose the underlying frame surfaces.

14 Claims, 5 Drawing Figures

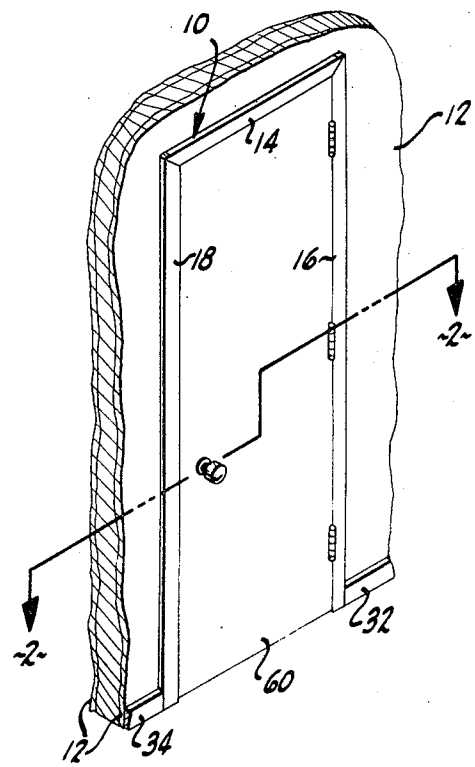


FIG. 1

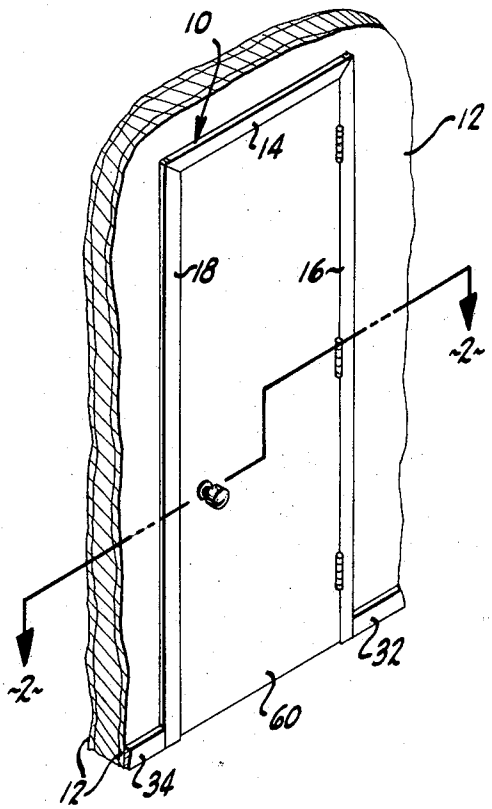
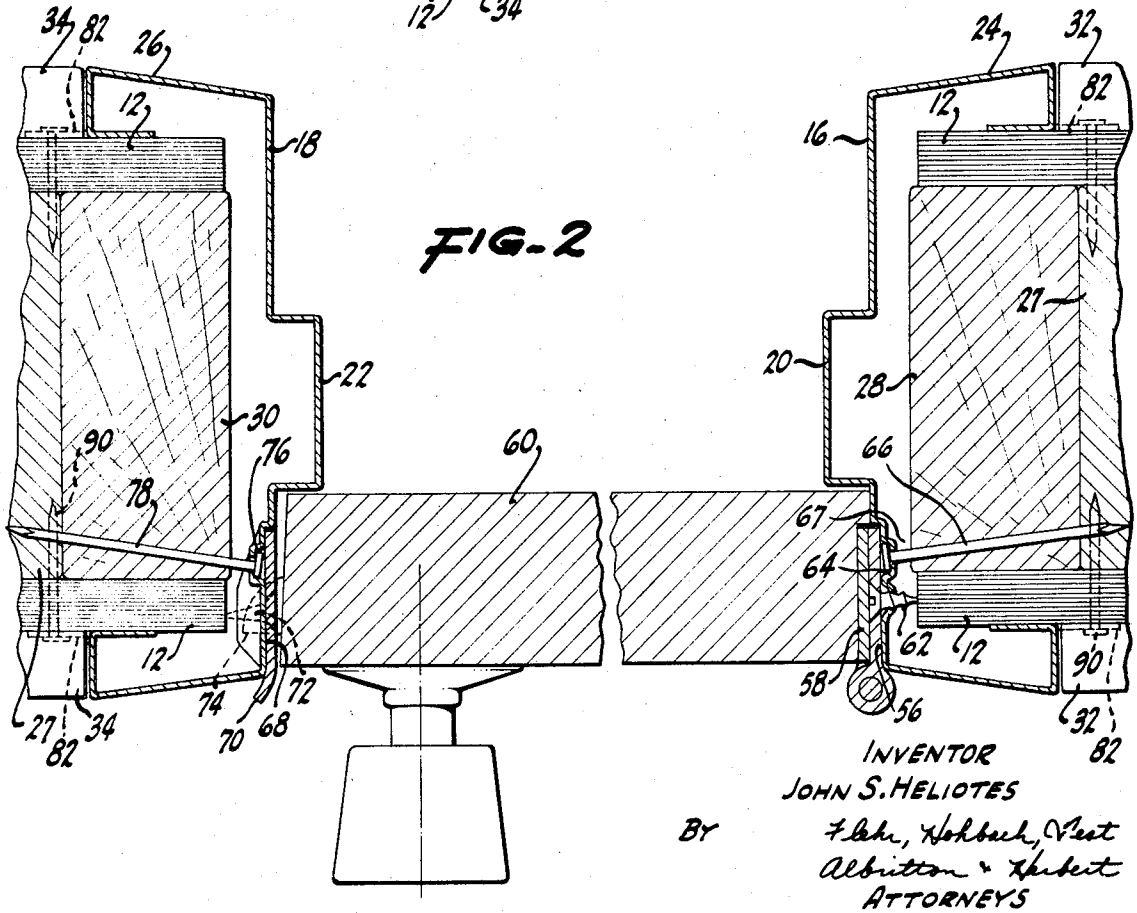


FIG. 2



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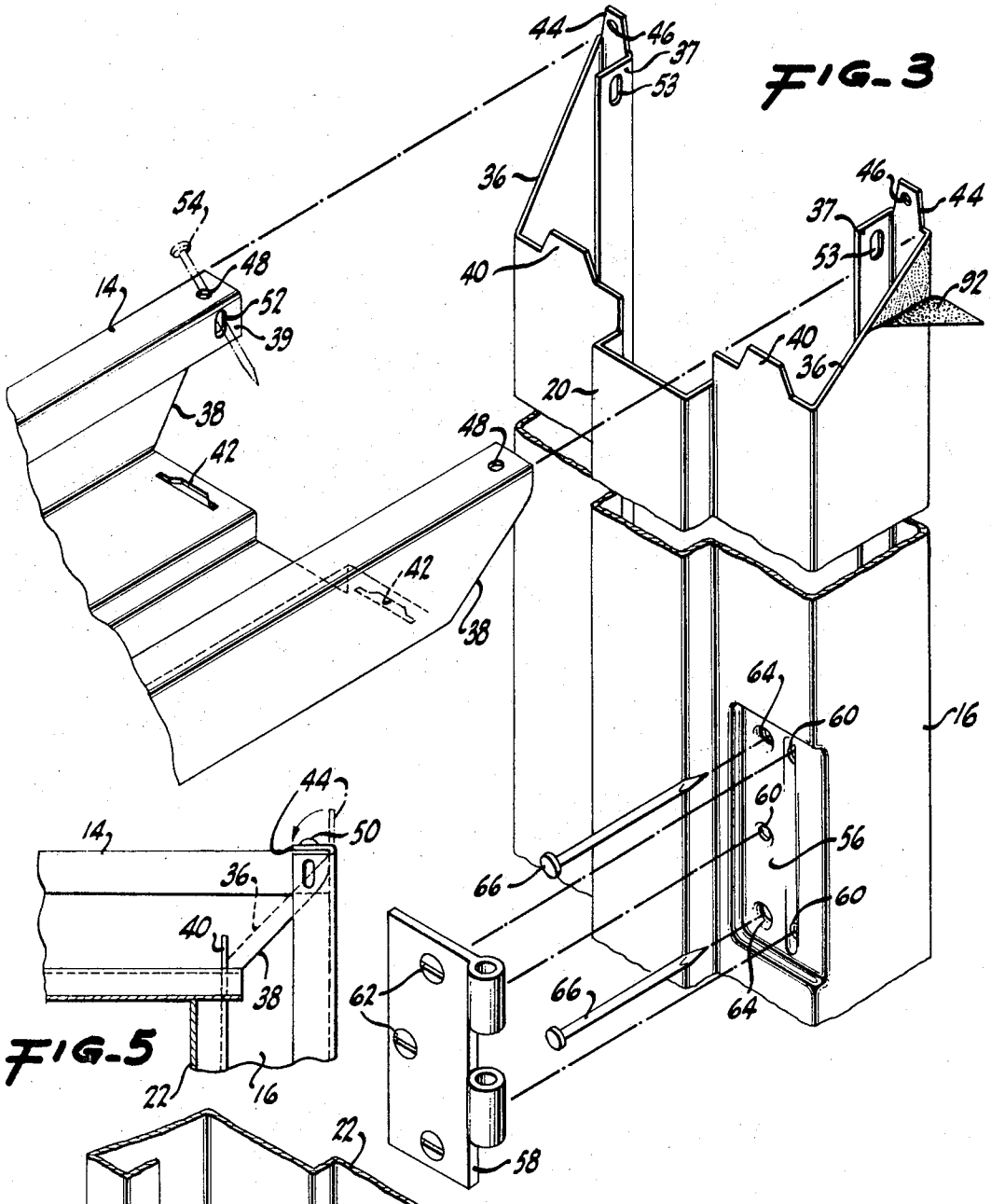


FIG-3

FIG-5

FIG-4

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QUICK INSTALLATION DOOR FRAME AND METHOD

BACKGROUND OF THE INVENTION

This invention relates to door frames and in particular relates to quick-installation door frames of formed metal construction.

Formed metal door frames have previously been provided for mounting a door within a wall structure. These prior art door frames are generally constructed of a number of separate parts for mounting the header and hinge and strike frame sides to the wooden cripples or studs, and are relatively expensive, are not of simplified construction, and do not lend themselves to rapid installation. It is conventional to install these door frames by means such as driving nails into the cripples through aligned holes formed in the casings of the frame sides. The outer holes are covered as with plastic plugs, but these plugs are objectionable in that they collect dust, are difficult to paint, and are unsightly. Moreover, the frame sides must be nailed flush against the cripples with the result that if the cripples are out of plumb then the frame will also be out of plumb. Certain of the prior art door frames incorporate welded mounting tabs which are expensive to fabricate and are susceptible to breakage if the frame is unduly stressed. Moreover, the prior art door frames do not provide a simplified arrangement for mounting the frame sections in a manner completely concealing the fasteners, e.g. nail heads, for aesthetic appeal. Accordingly, the need has been recognized for an improved, quick-installation door frame of formed metal construction.

OBJECTS AND SUMMARY OF THE INVENTION

It is an object of the invention to provide apparatus and method of assembly for a metal door frame of simplified, inexpensive construction which is adapted for quick installation.

Another object is to provide apparatus and method of assembly for a door frame of formed metal construction incorporating means for simplified mounting of the hinge or strike frame sides to the associated cripples so that the fastener means are trapped by the hinge or strike plates in a manner affording correct vertical alignment of the frame sides, and concealment of the fasteners from view. The invention makes it feasible to eliminate the many holes formed in the casings of existing metal door frames, as well as eliminating the plugs used to cover such holes.

Another object is to provide apparatus and method of assembly for a metal door frame in which the frame sides are joined to a header by means of an overlapping, nesting miter joint specially adapted to prevent the joint from opening up.

Another object is to provide apparatus and method of assembly for a door frame of formed metal construction incorporating bendable tabs formed at the lower ends of the hinge or strike frame sides for rapid and concealed attachment thereof to a wall structure.

The method of the invention comprises joining the ends of a horizontal header with the corresponding upper ends of hinge and strike frame sides. Fastener means are caused to extend through depressions formed in the hinge or strike frame sides and into the associated cripples. Hinge plates and/or a strike plate are installed to trap the fastener heads in the depressions so that the fasteners are concealed from view while securing the frame sides spaced from the cripples to accommodate any out-of-plumb condition. Tabs at the lower ends of the frame sides are squarely bent into alignment with the associated wall and fastened thereto in a manner affording a range of vertical adjustment, and with the tabs concealed by a wall base member or rug.

The door frame assembly includes a header and hinge and strike frame sides of formed metal construction. An overlapping nesting miter joint is formed between the ends of the header and frame sides. Depressions are provided in the frame sides for receiving hinge plates and/or a strike plate. Recessed holes are formed in the depressions for receiving fastener means whereby the hinges and strike plate trap the fastener heads in the depressions to accommodate any out-of-plumb condition and cover the fasteners from view. Pairs of integral bendable tabs are formed by means of notches in the lower edges of the frame sides with vertically elongate slots in the tabs to receive fastener means which extend into the associated wall.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the door frame assembly of the invention;

FIG. 2 is a cross sectional broken view to an enlarged scale taken along the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary exploded perspective view of the door frame of FIG. 1;

FIG. 4 is a fragmentary perspective view of the lower end of an exemplary frame side of the invention; and

FIG. 5 is a fragmentary elevational section view illustrating a connection of a side of the header with a frame side.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawings FIG. 1 illustrates generally at **10** a door frame assembly adapted for quick installation into a wall **12** according to the method of the invention. Door frame **10** comprises a horizontal header **14** extending between vertical hinge frame side **16** and strike frame side **18**. The header, hinge and strike frame sides are fabricated in a known manner from sheet metal to provide channel members of a cross section as illustrated in FIG. **2**. The hinge and strike frame sides are molded to define longitudinally extending door stops **20,22** and side casings **24,26** formed by reversely bending the frame edges. The side casings are adapted for mounting against a suitable wall structure such as the illustrated dry wall panels **12**. The dry wall panels in turn are secured to studs **27** and the upright cripples **28,30**. Wall base members **32,34** may be mounted along the base of the dry wall, as desired, or a rug and pad, not shown, may abut the wall.

The exploded perspective view of FIG. **3** illustrates the structure and method for assembling the frame sides, such as the exemplary hinge frame side **16**, with header **14** in the form of a miter joint. A similar joint is provided to connect the header with the strike frame side. The upper ends of the hinge frame casings are beveled at **36** and corresponding bevels **38** are formed at the ends of header **14**. The beveled ends **36,38** are dimensioned to extend into overlapping engagement,

as best illustrated in FIG. 5. The frame casing inner flanges 37 and opposed beveled edges 36 and 37 are flared apart slightly so that the corresponding beveled ends 38 and flanges 39 of the header will fit between the edges 36 in nesting relationship. This forms an overlapping miter joint which firmly holds the ends of the header and frame in place and prevents the joint from opening up, as if the building should settle. Such an open joint would be unsightly and require repair as by application of a filler or putty. A pair of male tabs 40 are integrally formed on the hinge frame side for locking engagement with a corresponding pair of guide slots 42 formed in the header. The apex of the juncture of the two frames is locked together by means of a pair of integral bendable tabs 44 on the hinge frame side. The tabs 44 are provided with openings 46 which, with the tabs bent at right angles as illustrated in FIG. 5, are aligned with corresponding openings 48 provided at the ends of the header. Metal screw fasteners 50 may be driven through these aligned openings to secure the header and frame sides together. Vertically elongate slots 52,53 are provided on the inwardly turned margin of the header and frame side in registry with the openings 48 to accommodate an optional fastening means comprising the nails 54, FIG. 3. These nails are driven through the aligned openings 48 and slots 52,53 into a wooden header, not shown, which would extend between the two upright cripples. The slots 52 provide for a variation in the angle at which the nails 58 can be driven into the wooden header.

A plurality of hinge depressions 56, corresponding in number to the desired number of hinge plates 58 to be used for mounting the door 60, are formed in hinge frame side 16 adjacent stop 20. A plurality of holes 60, illustrated as three, are formed in the base of the depression to receive the desired fastening means, such as nails or the illustrated screws 62, for securely mounting the hinge plates in position. A plurality of recessed openings 64, illustrated as two, are formed in the base of depression 56 to receive suitable fastening means, such as the illustrated ten-penny nails 66 which extend into the wooden cripple 28. The openings 64 are formed with concentric annular recessed portions of a size adapted to seat the nail heads so that each head is substantially flush with the base of the depression, as illustrated in FIG. 2. With hinge plate 58 mounted in place the heads of the nails are securely trapped and locked against the frame. This allows the frame side to be installed with a gap 67 separating it from the adjacent cripple and this in turn permits the hinge frame side to be assembled in vertical plumb even though the cripple may be out of plumb by as much as ¾ inch. Moreover, the hinge plate serves to conceal the nail heads from view for aesthetic appeal.

On the strike frame 18 a single depression 68 is formed adjacent stop 22 for receiving a strike plate 70. A plurality of holes are formed in the base of depression 68 for receiving suitable fastening means, such as the illustrated screws 72, adapted to secure the strike plate to the strike frame side in operating registry with a door latch 74. A plurality of recessed holes 76 are formed in the base of depression 68 to receive fastening means, such as the illustrated ten-penny nails 78, which extend into the wooden cripple 30. The holes are formed with concentric annular recessed portions of a size adapted to seat the nail heads flush with the base of depression 68 so that, with strike plate 70 mounted in place, the nail heads are concealed from view and trapped as explained above to allow the strike frame side to be assembled in vertical plumb even though the adjacent cripple may be out of plumb.

The lower ends of the hinge and strike frame sides are secured to the wall structure by means which include first and second superposed pairs of opposed integral bendable tabs 80,82. These tabs are formed by means of a plurality of notches 84 formed in the inwardly turned edges of the frame sides, as illustrated in FIG. 4 for strike frame side 18. Each of the tabs 80,82 is provided with a vertically elongate slot 86,88 adapted to receive a suitable fastener means such as the illustrated nail 90, FIG. 2, which is driven into the wall and stud members. The slots 86,88 provide a range of vertical adjustment of the frame side relative to the wall structure without the necessity of removing the fastener during the installation steps. The top tabs 82 would be used where a wall base member 32,34 is provided so that the base members would conceal the tabs and fasteners from view after assembly. The bottom tabs 80 would be used where no wall base member is provided, and these tabs and associated fasteners would be concealed from view by a rug and pad which would abut the wall. Thus, depending upon the particular application, either of the pairs of tabs 80,82 are bent back into alignment with the wall structure with the fasteners 90 then driven through the openings into the wall. It will be seen that the notched, bendable tabs are adapted to be easily bent square without any appreciable roundness at the bent portion, which otherwise would objectionably hold out any overlying wall base member.

Each of the header and strike and hinge frame sides are provided with an outer protective layer 92, preferably of a plastic film material. The layer 92 serves to protect from damage or scratching the painted and/or decorated surface of the frame members. The layer 92 is adapted to be manually stripped from the frame members after assembly. Thus, a workman can assemble the door frame and leave the protective layer in place for a period of time while remaining work in the area, such as wall painting, is completed. Following this the layer is stripped away leaving the frame surface in an unmarred, attractive condition.

In use, the method of assembling door frame 10 comprises joining the upper ends of the strike and hinge frame sides 16,18 to the header by pressing the header ends 38 and flanges 39 into nesting relationship between flared apart frame side flanges 37 and edges 36. The male tabs 40 are inserted into guide slots 42 in the header. Frame tabs 44 are bent over the header ends and fasteners such as screws 50, or the alternate nails 54, are mounted through the aligned openings. The lower ends of the frame sides are secured to the wall structure by bending backwardly the upper pair of tabs 82, where the wall base members 32,34 are utilized, or the lower pair of tabs 80, where no wall base member is used. Fasteners such as the nails 90 are driven through the slots 86,88 securing the tabs to the wall, with vertical adjustment being provided through these slots without the requirement of removing the fastener nails while completing installation of the door

frame. Hinge frame side **16** is correctly plumbed and then secured to wooden cripple **28** by driving the nails **66** through opening **64** with the nail heads seated flush within the recesses of these holes. The hinge plates **58** are then installed in the hinge depressions **56** by driving the screw fasteners **62** into holes **60**, thus trapping the nail heads so that the frame side is secured against displacement with respect to the frame side. Strike frame side **18** is secured to wooden cripple **30** by driving nails **78** through recessed holes **76** with the nail heads seated flush within the recessed portions of strike depression **68**. Strike plate **70** is then mounted into this depression for trapping the nail heads by means of screw fasteners **72**. The hinge and strike plates thus conceal the heads of fasteners **66,78** from view. The wall base members **32,34**, or a rug and pad, are installed in a manner covering either the pair of tabs **82**, or the alternate pair of tabs **80**, from view. After assembly of the door frame in the foregoing manner, the protective layer **92** is stripped from the header and strike and hinge frame sides exposing the underlying surface to view.

While the foregoing embodiments are at present considered to be preferred it will be understood that numerous variations and modifications may be made therein and it is intended to cover in the appended claims all such variations and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A method of assembling a door frame having formed metal hinge and strike frame sides for mounting adjacent vertical cripples of a wall structure and extending downwardly from a formed metal horizontal header, the hinge or strike frame sides being formed with depressions for mounting respective hinges or a strike plate and recessed openings in the depressions for receiving fastener means, the method including the steps of joining the header ends with the corresponding upper ends of the hinge and strike frame sides with the latter frame sides positioned adjacent said cripples, causing first fastener means to extend through the recessed openings into the associated cripple for fastening the frame sides thereto, and mounting said hinges or strike plate into the corresponding depressions to conceal from view said first fastener means, the improvement comprising providing, at the lower ends of said hinge and strike frame sides, at least one integral bendable tab having a vertically elongate slot, the method including the steps of bending said tab on either frame side into alignment with the adjacent wall structure, and causing second fastener means to extend through the tab slot into the wall structure whereby said frame side lower end is secured thereto with a range of relative vertical adjustment being provided between the frame sides and wall structure.

2. A method as in claim **1** for mounting said frame sides in vertical alignment with respect to adjacent cripples which may be out of vertical alignment, wherein the hinge or strike frame sides are positioned in vertical alignment in spaced apart relationship from respective cripples, said first fastener means are caused to extend through said recessed openings into the cripples, and said hinges or strike plate are mounted into said depressions to trap said fastener means and preclude displacement thereof with respect to the frame sides.

3. A method as in claim **1** in which the depressions are formed with recessed annular portions around said openings and the first fastener means includes fasteners each having a head adapted to seat into the recessed portions, the method including the steps of inserting the fasteners through the openings with the outer surface of the heads seated in the recessed portion flush with the depression, and the hinges or strike plates are mounted in the depressions against the heads to trap the latter within the recessed portions.

4. A method as in Claim **1** in which the hinge and strike frame sides and header are provided with an outer, protective layer, the method including the step of stripping said layer from said frame sides and header following assembly thereof.

5. A door frame assembly for mounting a door between upright cripples of a wall structure, including the combination of a horizontal header extending between said cripples, at least a hinge or strike frame side extending below the header in association with a respective cripple, the hinge or strike frame side being formed with one or more depressions to receive respective hinges for mounting the door, or to receive a strike plate for operation with a door latch, means joining the header ends with the corresponding upper ends of the hinge or strike frame sides, said depressions being formed with recesses to receive first fastener means extending through said hinge or strike frame sides into the associated cripple for fastening the frame sides thereto, and hinges or a strike plate mounted in the depressions of respective hinge or strike frame sides to trap said first fastener means within the recesses and conceal the first fastener means from view, the lowermost ends of the hinge or strike frame sides being formed with top and bottom superposed pairs of opposed bendable tabs, said top pair of tabs being formed with openings to receive, when bent into alignment with an adjacent wall, second fastener means to secure the hinge or strike frame sides to said wall, said bottom pair of tabs being formed with openings to receive, when bent into alignment with an adjacent wall, second fastener means to secure the hinge or strike frame sides to said wall, said top and bottom tabs and second fastener means being positioned with respect to an associated wall base member or rug for concealment from view.

6. A door frame as in claim **5** in which the hinge and strike frame sides are of sheet metal construction formed to extend along and straddle the associated cripple, and the depressions comprise segments of the frame sides extending inwardly toward the associated cripple whereby a hinge or strike plate seated therein is substantially flush with the outward frame surface.

7. A door frame as in claim **5** in which the hinge or strike frame sides are positioned in spaced apart relationship with respect to the associated cripple, and said first fastener means is trapped to preclude displacement of the frame sides to accommodate any out-of-plumb condition of the cripples.

8. A door frame as in claim **7** in which said fastener means comprises a fastener having a head, and said depression is formed with an annular recess portion associated with said hole for seating said first fastener head therein with the head outer surface substantially flush with the base of the depression.

9. A door frame as in claim 8 and including in the combination said first fastener means comprising a nail extending through said hole into the cripple, with the nail having a head seated in said annular recess.

10. A door frame as in claim 5 in which a removable protective layer is formed on the outer surface of the header, hinge or strike frame sides whereby following assembly thereof said layer is removed exposing the underlying frame surfaces.

11. A door frame as in claim 5 in which the openings in either of the top or bottom pair of tabs comprise vertically elongate slots adapted to receive said second fastener means affording a range of vertical adjustment of said frame sides with respect to the wall without requiring removal of said fastener means.

12. A door frame as in claim 5 in which the hinge or strike frame sides include side casings formed with outwardly flared apart upper edges, and said header is formed with beveled end edges nesting between and in overlapping engagement with said upper edges of the frame sides to define a miter joint therewith.

13. A method of assembling a door frame having formed metal hinge and strike frame sides for mounting adjacent vertical cripples of a wall structure and extending downwardly from a formed metal horizontal header, the improvement comprising providing, at the lower ends of said hinge and strike frame sides, at least one integral bendable tab having a vertically elongate slot, the method including the steps of bending said tab on either frame side into alignment with the adjacent wall structure, and causing fastener means to extend through the tab slot into the wall structure whereby said frame side lower end is secured thereto with a range of relative vertical adjustment being provided between the frame sides and wall structure.

14. A door frame assembly for mounting a door between upright cripples of a wall structure, including the combination of a horizontal header extending between said cripples, at least a hinge or strike frame side extending below the header in association with a respective cripple, the lowermost ends of the hinge or strike frame sides being formed with at least one pair of opposed bendable tabs, said tabs being formed with vertically elongate slots for receiving fastener means, said tabs being adapted for alignment with respect to the adjacent wall structure for receiving said fastener means and securing said hinge or strike frame sides thereto, the tabs and fastener means being positioned with respect to an associated wall base member or rug for concealment from view.

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