March 29, 1955 C. D. DANIELSON 2,704,868

METAL TIE FOR JOINING AND BRACING WOOD FRAMING

Filed March 28, 1950

FIG. 1.

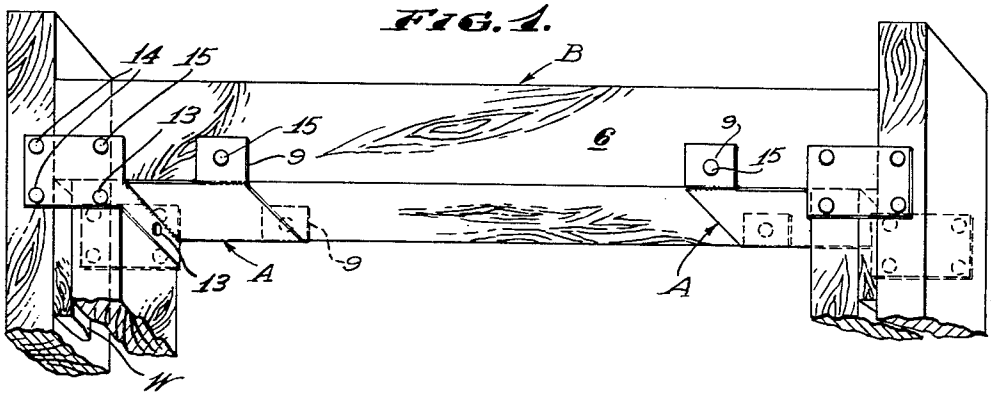


FIG. 2.

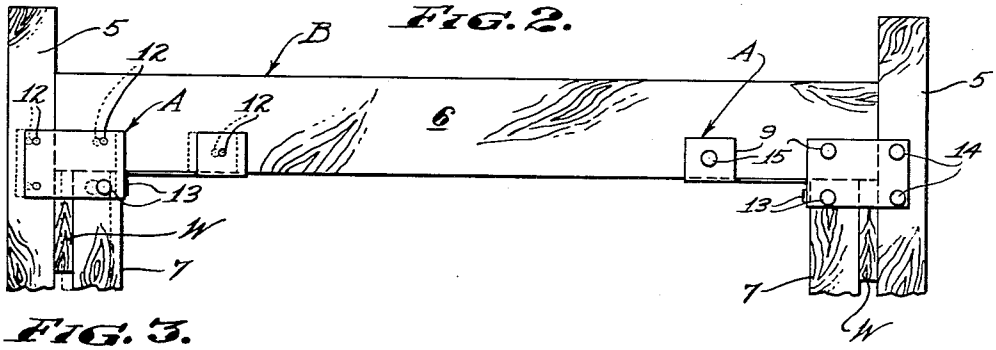


FIG. 3.

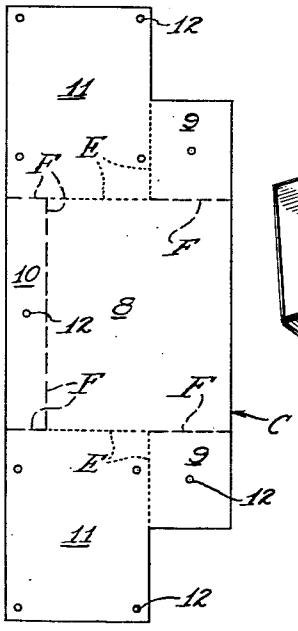
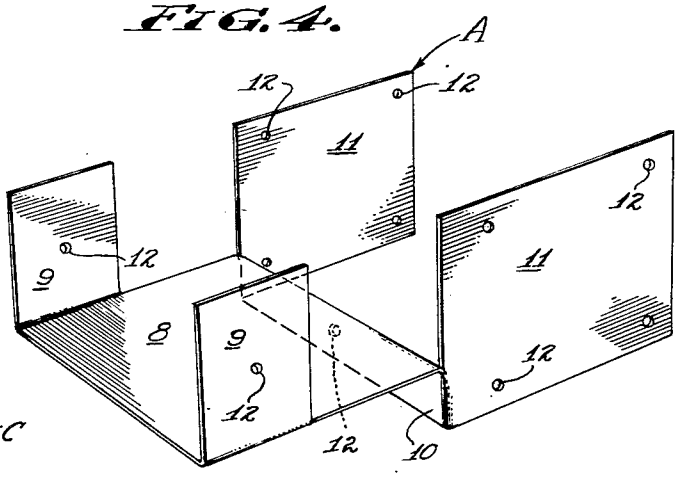


FIG. 4.



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METAL TIE FOR JOINING AND BRACING WOOD FRAMING

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3 Claims. (Cl. 20—95)

This invention relates to a novel metal tie member for the wood framing of building construction and more particularly pertains to a metal tie and reinforcing member for joining the headers, studs, and trimmers of framing for the door and window openings of buildings.

In constructing framing for door and window openings, it is the common practice to assemble the header and trimmers between the studs, in most instances with a greater spacing of the trimmers than required for accommodating the door or window frame of given dimensions, and with trimmers lightly toenailed to the header. In order to obtain exact spacing of the trimmers for properly fitting the door or window frame therebetween, wedges are driven between the trimmers and the studs and when the trimmers are properly adjusted, they are set by a finished toenailing thereof to the header. The header is secured in place by nails which are driven thru the studs and enter the ends of the header in the direction of the grain of the wood. Due to this toenailing and the nailing of the header in the direction of the grain, the framing is weak at the joints of the studs with the header, with the result that under stresses caused by shrinkage, settling of the building and earthquakes, these joints will loosen and the framing will become warped or otherwise distorted. In many cases this distortion loosens the wedges so that they will drop from the upper part of the framing, leaving the trimmers unstable and subject to movement out of set position under the aforesaid stress conditions. As a result of this distortion or derangement of the framing, plaster walls adjacent thereto become cracked and the door frames or window frames will also be distorted with consequent jamming and failure of proper operation of the doors and windows.

It is the primary object of the present invention to provide a sheet metal tie and brace member for use in the construction of framing of the character described which will simplify and expedite the operation of forming the framing and eliminate the objections and weaknesses heretofore present in the finished framing, in that the toenailing of the frame and the dependence upon the nailing in the direction of the grain of the headers are eliminated and the several frame members are more securely tied together by the tie members hereof and effectively reinforced to maintain the proper set thereof under the stress conditions which heretofore have been objectionable and damaging.

Another object of the invention is to provide a sheet metal tie plate for reinforcing the corner construction of wood frame doors and windows which can readily be formed in a die at a relatively low cost and which through its new and novel shape may be easily applied to provide in the framing strength and durability beyond that of the framing as heretofore made.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed, and illustrated by way of example in the accompanying drawing, in which:

Fig. 1 is a fragmentary perspective view of framing as constructed with tie members embodying this invention.

Fig. 2 is a fragmentary front elevation of the framing shown in Fig. 1, showing at the left side thereof how the trimmers may be adjusted with the tie member

nailed thereto, preliminary to nailing the tie members to the studs and header.

Fig. 3 is a top plan view of the blank from which the tie member hereof is formed, and

Fig. 4 is an enlarged perspective view of the tie member per se.

In the accompanying drawing, two tie members A constructed in accordance with this invention are shown applied to that part of a building which forms a wood framing B for a door opening or a window opening. This framing includes studs **5**, a header **6**, and two trimmers **7**, which as here shown are securely tied together by means of the two tie members A, each of which encompasses and is nailed to one of the studs **5**, the header **6**, and one of the trimmers **7** in a particular manner which will hereinafter be fully described.

The tie member A is formed from a sheet metal blank C shown in Fig. 3, wherein the short dash lines E indicate where the blank is cut and the long dash lines F indicate where the blank is folded and bent to form the finished tie member shown in Fig. 4.

As shown in Fig. 4, the tie member includes a rectilinear base plate **8**, a pair of opposed upstanding tie plates **9** integral with opposite side edges of the base plate, a depending flange **10** integral with the transverse edge of the base plate situated intermediate the ends of the tie member, and a pair of opposed upstanding tie plates **11** integral with the ends of the flange and extending outwardly therefrom at right angles thereto in the same vertical planes as the plates **9**. In Fig. 3, those portions of the blank C which form the base plate, anchor plates, flange and tie plates are designated **8**, **9**, **10**, and **11** respectively, to indicate how such portions form the finished article.

The base plate **8** is substantially equal in width to that of the header **6** and is adapted to lie against the under face of the header so that the tie plates **9** will lie against opposite sides of the header, the flange **10** will lie against the inner vertical face of the associated trimmer **7**, and the tie plates **11**, will overlie the opposite side faces of the header, the trimmer and the stud.

Provision is made for fastening the flange **10**, tie plates **9**, and tie plates **11** to the framing members **5**, **6**, and **7** by means of nails, there being holes **12** therein arranged so that the nails will be placed in the best possible manner to assure a secure fastening of the frame members together.

In the use of the tie members, two thereof are applied to the framing B before the header **6** and trimmers **7** are secured in place, so that the flange **10** will abut the inner vertical faces of the trimmers while the plates **9** lie against the side faces of the header, and the plates **11** likewise lie against the side faces of the studs and trimmers as well as against the side faces of the header. When positioned in this manner, the tie members A are fastened by means of nails **13** to the inner vertical faces and the side faces of the trimmers **7**, to the exclusion of nailing the members at this time to the studs and the header, there being three of the nails **13**—one thru the flange and one thru each of the two tie plates **11**. The left side of Fig. 2 shows how this preliminary fastening of tie members to the trimmers **7** is effected and indicates by the dotted lines how typical adjustment of the trimmers may be made while the tie members are fastened thereto.

The trimmers may be adjusted as required for reception of the particular door frame or window frame as the case may be, by driving wedges W between the studs **5** and the trimmers. When the desired spacing of the trimmers has been effected, the tie members A are first secured by the nail **14** to the studs **5**, then secured by nails **15** to the header.

It should be noted that the method of fastening the tie members and the order of nailing them first, to the trimmers, then to the studs and finally to the headers is important as is also the directions in which the nails are driven and the relative locations thereof. By fastening the tie members to the trimmers only, before nailing them to the studs and header, the trimmers and the header are subject to ready relative adjustment without being toe-

nailed, as they are held in properly assembled relation by the plates **9** and **10** while adjusting the trimmers. Once the trimmers are adjusted as required, the plates **9** and **10** are automatically disposed in proper position to be nailed to the studs and the header. In this connection it should be noted that the length of the tie plates is such that they will effectively overlie the adjacent surfaces of the three frame members in position to be nailed thereto. As here provided each tie member A is secured to the studs by the four well placed nails **14** which pass thru the holes **12** in the tie plates **11**, and these plates are also secured to the header by two of the nails **15** and to the trimmers by two of the nails **13**. The plates **9** are secured each by a single nail **15** to the header. This disposition of the nails assures a most secure and permanent fastening of the frame members to one another and that the reinforcing action of the tie members A will prevent twisting loosening and derangement of the joints of the header with the studs and the trimmers.

It should be noted that the tie member through its particular configuration presents a compound structural shape which includes a channel section at one end of the base plate and an angle section at the opposite end of the base plate, both sections being integral with and formed of portions of the base plate. Moreover, the two tie plates **11** in combination with the flange **10** form another channel which adds to the strength and the bracing action of the tie member.

The angle section formed by the base plate **8** and flange **10** in extending transversely of the header and trimmers at the joints of the header and trimmers, offers effective resistance to relative twisting of the header and trimmers. The channel section afforded by the base plate and tie plates **9** combines with the angle section to add further resistance to relative twisting of the header and trimmer. Further resistance to this twisting of the header relative to the trimmers and the studs is provided by the tie plates **11** in the overlapping and fastening thereof to adjacent faces of the studs, trimmers and headers.

While the tie member hereof is particularly applicable to framing composed of the studs, header, and trimmers as here shown, it should be understood that it may be used to advantage for joining any right angularly disposed wood frame members or framing similar to that here shown not having trimmers.

Due to the advantageous manner in which a framing may be erected with the tie members hereof, this invention embraces a new method of tying together, reinforcing and erecting frame members with metal tie units, which method consists in applying the tie units so as to embrace the joints of the frame members, fastening portions of the tie units to the frame members which are to be adjusted so that other portions of the tie members will lie against opposite sides of the other frame members, then adjusting the adjustable frame members, then nailing said other portions first to the studding and then to the header of the framing.

I desire it to be understood that I do not limit myself to the exact details of construction set forth, and that my

invention embraces such changes, modifications and equivalents of the parts and their formation and arrangement as come within the purview of the appended claims.

I claim:

1. A framing construction for openings of buildings comprising first and second parallel members and a cross member, one end of said first parallel member abutting a surface of said cross-member and one end of said cross member abutting a side of said second parallel member, and a tie member for securing all said members together comprising a base plate positioned against the abutted surface of said cross member at a location to one side of both said first and second members and having first opposed flanges extending from the sides of said base plate to engage opposed surfaces of said cross member, said plate having an end flange extending to engage a surface of said first parallel member, and second opposed flanges extending from the edges of said end flange, each of said second opposed flanges engaging a surface of said first and second members and said cross member.

2. A framing construction as defined in claim 1 having means for securing each of said second opposed flanges to said first and second members and said cross member, means for securing said end flange to said first member and means for securing each of said first opposed flanges to said cross member.

3. A framing construction for opening of buildings comprising a substantially vertical stud member, a substantially horizontal header member having one end abutting and secured to one side of said stud member, a trimmer member positioned substantially parallel to said stud member and spaced therefrom, said trimmer member having one end abutting the lower surface of said header member, and a tie member for securing all said members together comprising a base plate positioned along the lower surface of said header member with one edge adjacent the surface of said trimmer member located furthest away from said stud member, a depending flange extending downwardly from said edge along the surface of said trimmer member adjacent said edge, a first pair of opposed flanges extending from opposite vertical ends of said depending flange in a direction away from said base plate, each flange of said first pair being of sufficient size to have a portion adjacent a surface of all said members, a second pair of opposed flanges extending upwardly from opposite sides of said base plate along opposite surfaces of said header member, means for securing each flange of said first pair of opposed flanges to all said members, means for securing each flange of said second pair to said header member and means for securing said depending flange to said trimmer member.

References Cited in the file of this patent

UNITED STATES PATENTS

529,993	Allen	Nov. 27, 1894
933,067	Ferry	Sept. 7, 1909
1,870,132	Miller	Aug. 2, 1932
1,945,925	Stiefel	Feb. 6, 1934