March 17, 1959 H. R. MEYER 2,877,874

CORNER STUD

Filed April 7, 1953

FIG. 1.

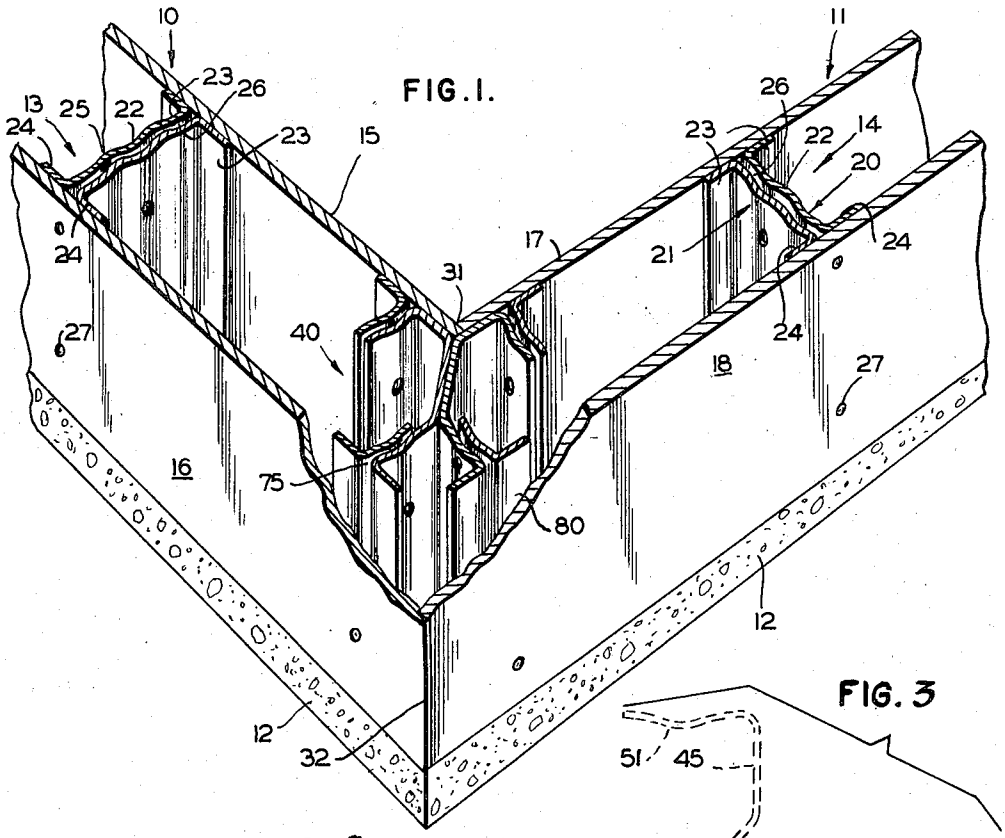


FIG. 2.

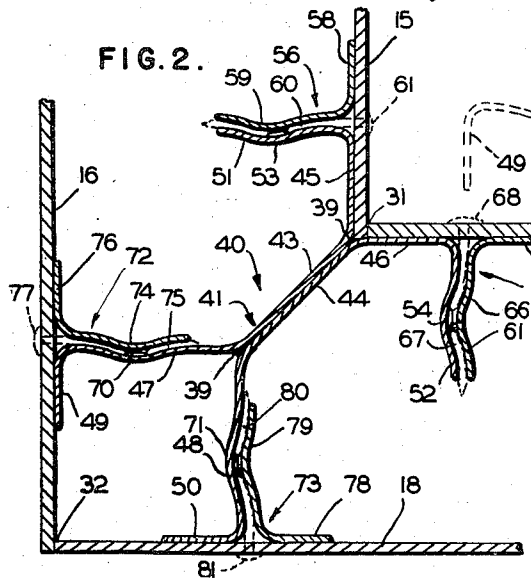
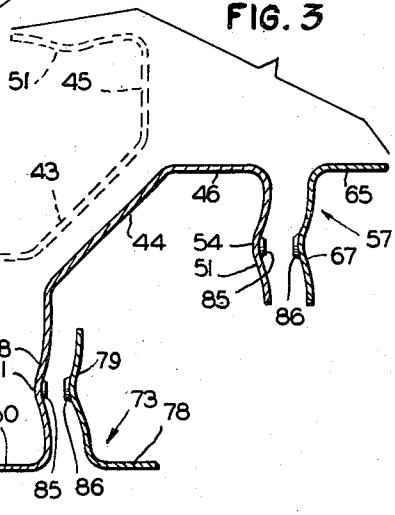


FIG. 3



INVENTOR

HENRY R. MEYER

BY

ATTORNEY

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CORNER STUD

Henry R. Meyer, Detroit, Mich., assignor to National Steel Corporation, a corporation of Delaware

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This invention relates to improvements in structural members formed from sheet metal material and more particularly to sheet metal structural members designed for use as studs at the corner of a building construction.

At the present time, a comparatively large amount of light steel framing is used for construction purposes. In this type of framing, structural members cold formed from hot or cold rolled steel strips are substituted for wood members or the old-fashioned hot rolled steel structural members. Where the structural members are substituted for wood joists and studs for example, the type of construction usually requires nailing of flooring, sheathing, etc. to the structural members. In the case of studding, the structural members generally comprise a pair of channel portions each including an intermediate web section joined in spaced back-to-back relation with the web section of the other channel portion to form a nailing groove, and flanges joined to the edges of the web section and extending at substantially right angles to the web section coplanar with respective flanges of the other channel portion. The flanges at corresponding ends of the web sections extend in opposite directions with the nailing groove therebetween and provide bearing surfaces for internal or external wall surfaces which may be positively anchored to the stud members by means of nail-like elements driven through the wall surfaces into the nailing grooves. With this type of stud construction, since the interior and exterior wall surfaces lie parallel to the coplanar flanges and substantially perpendicular to the web sections, the sheathing can not be closely anchored at the apex of outside corners without employing additional and different structural members. As a matter of fact, when employing this type of studding alone, the closest nailing point to the apex of an outside corner is equal to the summation of the dimension between flanges at opposite ends of a web section and the width dimension of one flange.

It is therefore an object of the present invention to provide a novel structural member for use as a stud member at the corner of a building construction.

Another object is to provide a novel structural member for use as a corner stud which allows sheathing or other surface material to be nailably attached to the structural member adjacent the apex of the outside corner of a building construction.

Another object is to provide a novel structural member for use as a corner stud which provides an arrangement for nailably securing sheathing or outside surface material in close proximity to the apex of an outside corner of a building construction while functioning to increase the strength of the corner wall construction.

Still another object of the present invention is to provide a novel structural member for use as a corner stud which may be easily fabricated from cold rolled sheet metal by a simple rolling process requiring a small number of passes.

A still further object of the present invention is to

provide a novel structural member of the character described above that is adapted to cooperate with conventional structural members to form a corner stud providing nail receiving grooves in close proximity of the apex of the outside corner of a building construction.

Other objects and features of the present invention will appear more fully below from the following detailed description considered in connection with the accompanying drawing which discloses one embodiment of the invention. It is to be expressly understood, however, that the drawing is designed for purposes of illustration only and not as a definition of the limits of the invention, reference for the latter purpose being had to the appended claims.

In the drawing in which similar reference characters denote similar elements throughout the several views:

Fig. 1 is an isometric view, partially in section, illustrating a novel corner stud embodying the principles of the present invention shown at the corner of a building construction;

Figure 2 is a plan view, in section, showing the corner stud provided by the invention in greater detail; and

Fig. 3 is an exploded view further illustrating the present invention.

A corner stud constructed in accordance with the principles of the present invention includes a pair of identical, novelly shaped, structural members connected in back-to-back relation and adapted to cooperate with conventional angle strip structural members to form wall bearing surfaces and nail receiving grooves on both sides of and adjacent to the line of intersection of the outer wall surfaces and the line of intersection of the inner wall surfaces of a corner of a building construction including spaced inner and outer wall surfaces. The identical structural members include web portions joined together in back-to-back relation which lie in a plane passing through the lines of intersection of the inner and outer wall surfaces. Each of the web portions are provided at their inner marginal edges with a first flange portion extending parallel to one of the inner wall surfaces, with the first flange portions extending in opposite directions in substantial quadrature relation providing wall bearing surfaces at the inside corner of the building construction. Each first flange portion is joined at its free marginal edge with a perpendicularly disposed second flange portion extending inwardly of the wall construction away from the interior wall surface. The second flange portions are provided with corrugated surfaces and are adapted to cooperate with conventional angle strip structural members having a complementary corrugated flange to provide a nail receiving and retaining groove on both sides of and adjacent to the line of intersection of the internal surfaces. The other marginal edges of the web portions are joined to third flange portions diverging outwardly from each other in a direction substantially perpendicular to respective first flange portions. The free marginal edges of the third flange portions are joined to fourth flange portions which lie parallel to respective first flange portions. Each of the fourth flange portions extend parallel to one of the outer wall surfaces toward the apex of the outer corner, in substantial quadrature relation with the other fourth flange portion to provide bearing surfaces adjacent the apex of the outer corner for the outer wall surfaces. The third flange portions are provided with corrugated surfaces and are adapted to cooperate with the complementary corrugated flange of conventional angle strip structural members to provide nail receiving grooves for each of the outer wall surfaces adjacent the apex of the corner of the building construction.

The foregoing will be more fully understood with reference to the drawing in which the principles of the pres-

ent invention are disclosed in connection with a building construction including intersecting walls 10 and 11 supported on a foundation 12. The walls 10 and 11 include a plurality of laterally-spaced vertically-disposed stud members 13 and 14, respectively, only one of which is shown for each of the walls. The stud members 13 and 14 rest upon the foundation 12 and carry the vertical loads of the building while providing supporting surfaces for the inner and outer wall coverings. In particular, the stud members 13 support the inner covering 15 and the outer covering 16 for the wall 10, while the said members 14 support the inner wall covering 17 and the outer wall covering 18 of the wall 11. The stud members 13 and 14 may be of similar construction made up of a pair of channel-shaped members 20 and 21 connected in back-to-back relation. The channel members include web portions 22 terminating in coplanar flange portions 23 and 24 at their opposite edges. The web portions 22 are mounted in spaced relation and are provided with longitudinally extending complementary corrugations 25 which cooperate to form a sinuous groove 26 between the channel members. The coplanar flange portions 23 and 24 of the channel members provide bearing surfaces for the inner and outer wall coverings, respectively. The inner and outer wall coverings are secured to the stud members by driving a nail through the wall coverings into the sinuous groove between the channel members as illustrated by the nails 27.

In a building construction employing walls including vertically positioned stud members supporting spaced parallel inner and outer wall coverings, the inner and outer wall coverings intersect at the corners of the building construction with the lines of intersection between adjacent inner wall coverings and adjacent outer wall coverings lying in a substantially common plane disposed diagonally with respect to the plane of the web portions of the vertical stud members. For this reason, employment of conventional stud members, such as the stud members 12 and 13, at the corner of a building construction would not provide adequate means for supporting the outer wall coverings. This is so since stud members positioned as close as possible to the line of intersection between the inner wall coverings would provide a nailing point for the outer wall covering displaced from the line of intersection of the outer wall covering a distance equal to the summation of the depth dimension of the stud members and the width dimension of one flange portion. Such an arrangement does not provide a strong corner construction or adequate support for the outer wall coverings, and heretofore it has been necessary to provide specially constructed facing members for use in the corner construction of buildings employing light weight steel structural members. This necessity has increased the cost of the construction and materially reduced the advantages gained by employing prefabricated light gauge steel structural members of the nailable type.

As mentioned above, it is an object of the present invention to provide a novel structural member specifically designed for use as a corner stud which provides a strong corner construction and adequate support for the outer wall coverings and overcomes the disadvantages mentioned above. According to the present invention, the corner stud is made up of two identical structural members of relative simple cross-sectional configuration which may be fabricated by a rolling process requiring only a relatively few simple passes. The structural members are designed to cooperate with conventional angle strip members to provide a strong corner construction presenting inner and outer wall bearing surfaces and nailing grooves adjacent the lines of intersection of the inner and outer wall coverings.

As shown in the drawing, the foregoing means comprises a corner stud 40 generally positioned in a plane passing through the line of intersection 31 of the inner wall coverings 15 and 17 and the line of intersection 32, or the apex, of the outer wall coverings 16 and 18. The corner stud 40 is made up of two identical structural members 41 and 42 connected in back-to-back relation. The structural members 41 and 42 each include a web portion 43 and 44, respectively, which lie in face-to-face relation throughout their width and length and are rigidly joined in any suitable manner such as on edge welds 39. The marginal edges of the web portions 43 and 44 adjacent the inner surfaces of the walls 10 and 11 extend up to the outside corner of the inner wall coverings and merge into first flange portions 45 and 46, respectively. The first flange portions 45 and 46 extend symmetrically from the inside edges of their web portions 43 and 44 away from the common plane of the web portions in quadrature relation so that their inside surfaces define bearing surfaces for respective, parallel inner wall coverings. The opposite marginal edges of the web portions 43 and 44, or their outer edges, are located at substantially the midpoint between the lines of intersection 31 and 32 measured along the diagonal plane. At their outer marginal edges, the web portions 43 and 44 merge into second flange portions 47 and 48, respectively, which diverge in opposite directions away from the diagonal plane and extend outwardly from the outer edges of respective web portions in a plane substantially perpendicular to the first flange portions 45 and 46 and the outer wall surfaces 16 and 18, respectively. The second flange portion 47 extends from the outer edge of the web portion 43 to a point adjacent the inside surface of the outer wall covering 16 and merges into a third flange portion 49 extending parallel to the first flange portion 45 and to the outer wall covering 16 in a direction towards the line of intersection 32. The second flange portion 48 of the structural member 42 terminates adjacent the inside surface of the outer wall covering 18 and merges into a third flange portion 50 extending parallel to the inner surface of the outer wall covering 18 and to the first flange portion 46 in a direction toward the line of intersection 32.

In order to positively secure the inner and outer wall coverings to the wall covering bearing surfaces presented by the first flange portions 45 and 46 and by the third flange portions 49 and 50, means are provided for forming nail receiving grooves in the bearing surfaces. For this purpose the structural members 41 and 42 are fabricated in such a manner as to form the nail receiving grooves upon cooperation with conventional angle strip members comprising stock items employed in the manufacture of other nailable structural members. In particular, the free marginal edges of the first flange portions 45 and 46 each merge into a fourth flange portion 51 and 52, respectively, extending inwardly of the inner wall coverings 15 and 17 substantially perpendicular to respective first flange portions 45 and 46. Each of the fourth flange portions 51 and 52 are provided with sinuous surfaces or longitudinally extending corrugations 53 and 54. The corrugations 53 and 54 are formed as to be complementary with the corrugations of angle strip structural members 56 and 57, respectively. The angle strip structural member 56 includes a flat flange portion 58 lying coplanar with the first flange portion 45 and a longitudinally corrugated flange portion 59 disposed in substantially quadrature relation with respect to the flat flange portion 56. The fourth flange portion 51 and the corrugated flange portion 59 are joined together in spaced relation with their corrugated surfaces in complementary relation to present a sinuous nail receiving groove 60 therebetween adapted to receive a nail driven through the inner wall covering 15, such as the nail 61. The angle strip structural member 57 includes a flat flange portion 65 coplanar with the first flange portion 46 and a corrugated flange portion 66 joined to the fourth flange portion 52. The fourth flange portion 52 and the flange portion 66 are arranged with the corrugation in comple-

mentary relation and being joined in spaced relation to provide a sinuous nail receiving groove 67 for receiving a nail, such as nail 68, passing through the inner wall covering 17 to secure the inner wall covering onto the corner stud 40.

The second flange portions 47 and 48 are provided with longitudinally extending corrugated surfaces 70 and 71, respectively, and are each adapted to cooperate with angle strip structural members 72 and 73, respectively, which may be similar to the angle strip structural members 56 and 57. The angle strip structural member 72 includes a corrugated flange portion 74 having corrugations to which the corrugations 70 of the second flange portion 47 are complementary. The flange portions 47 and 74 are joined together in spaced relation with their corrugations in complementary relation to provide a sinuous nail receiving groove 75 therebetween. The angle strip structural member 72 also includes a flat flange portion 76 coplanar with the third flange portion 49 and extending in the opposite direction therefrom. The angle strip structural member 73 includes a flat flange 78 and a corrugated flange 79 joined to the second flange portion 48 in a manner similar to the angle strip structural member 72 to provide a sinuous nail receiving groove 80 for receiving a nail 81 driven through the outer wall covering 18 to secure the outer wall covering against the outer wall covering bearing surfaces provided by the flanges 50 and 73 and onto the corner stud 40.

The angle strip structural members 56, 57, 72 and 73 may be joined to respective flange portions of the structural members by any suitable means to provide the proper spacing between cooperating corrugated flange members to form receiving grooves of the desired width. This spacing may be predetermined by forming dimples or inwardly extending buttons on the cooperating flanges so that respective dimples contact each other and determine the relative distances between the flanges. For example, as shown more particularly in Fig. 3, the fourth flange portion 51 of the structural member 44 may be provided with a dimple 85 for contacting the surface of a dimple 86 formed on the corrugated flange of the angle strip structural member 57. The dimples 85 and 86 are proportional to provide the proper space between the complementary corrugated surfaces when the dimples are in face-to-face contact as illustrated in Fig. 2 of the drawing. The cooperating corrugated flanges may be joined together at the point of the contacting dimples 85 and 86 by means of a rivet or by welding. Of course, it is expressly understood that other means may be employed for joining the flanges having the complementary corrugated surfaces as well as for predetermining the spacing therebetween.

As shown more clearly in Fig. 3 of the drawing, the corner stud 40 provided by the present invention is made up of a pair of identical structural members 43 and 44 designed in such a manner as to cooperate with each other and with four identical angle strip structural members, preferably corresponding to angle strip structural members which are a common stock item. For example, the angle strip structural members may constitute a structural member that is employed in the fabrication of half-stud or T-shaped structural members similar to half of the stud members 13 and 14 when split longitudinally along the web portions. The structural members 43 and 44 are therefore fabricated so that their corrugated flange portions are capable of cooperating with the corrugated flange portion of readily available angle strip structural members. With this arrangement, manufacture of the novel corner stud member only necessitates fabrication of a single, specifically formed, structural member. This structural member, namely the structural member 43 or 44, is characterized with a comparatively simple cross-section and may be easily manufactured by employing a comparatively simple rolling process necessitating a small number of passes.

As seen more clearly in Figs. 1 and 2, the nail receiving grooves 75 and 80 are located in relatively close proximity to the apex of the corner formed by the terminating edges of the outer wall coverings 16 and 18. The nail receiving grooves may be positioned in closer proximity to the apex of the outside corner by increasing the length of the web portions 43 and 44 outwardly toward the line of intersection of the outer wall surfaces 16 and 18 to thus move the nailing grooves closer to the apex. The extent of this modification is limited by the space required for the corrugated flanges forming the nail receiving grooves which, for the sake of simplicity of construction, usually extend perpendicular of the outer wall surfaces. Also, the length of the corrugated flanges are usually determined by the dimensions of the angle strip structural members available to thus reduce the over-all cost of the corner stud. In some cases, it may be desirable to extend the third flange portions 49 and 50 outwardly to the plane passing through the line of intersection of the wall coverings and to rigidly join the adjacent edges, by welding for example, to provide a structural element of increased strength.

A corner stud construction of the character disclosed and described herein also materially increases the strength of the corner construction. This is so since the inner and outer corners are diagonally braced, and since the inner and outer covering bearing surfaces are in close proximity to the lines of intersection of the inner and outer wall coverings.

Although only one embodiment of the invention has been disclosed and described above, it is expressly understood that various changes and substitutions may be made therein without departing from the spirit of the invention as well understood by those skilled in the art. Reference therefore will be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A corner stud for use in the corner construction of a wall structure having spaced inner and outer wall surfaces in which the line of intersection of the inner wall surfaces and the line of intersection of the outer wall surfaces lie in a plane disposed at a fixed angle with respect to the inner and outer wall surfaces, comprising a pair of structural members adapted to be connected in back-to-back relation; each of the structural members being formed from a single piece of elongated sheet material and comprising an elongated planar web portion having an inner surface and an outer surface, the inner surfaces being connected in back-to-back relation; each of the structural members comprising a first elongated flange portion joined at one of its edges to one longitudinal edge of the elongated planar web portion and inclined outwardly from the outer surface of the elongated planar web portion at said fixed angle with respect to the plane, a second elongated flange portion joined at one of its edges to the other longitudinal edge of the elongated planar web portion and inclined outwardly from the outer surface of the elongated planar web portion and extending in a direction away from the first elongated flange portion and at an angle perpendicular to the first elongated flange portion, a third elongated flange portion joined to the other edge of the second elongated flange portion at substantially right angles thereto and parallel to the first elongated flange portion and extending in a direction away from the one edge of the first elongated flange portion, and a fourth elongated flange portion joined to the other edge of the second elongated flange portion at substantially right angles thereto and parallel to the second elongated flange portion and extending in a direction toward the other edge of the second elongated flange portion; the second and fourth elongated flange portions of each of the structural members including corrugated surfaces, and a flange member associated with the second and fourth

elongated flange portions of each of the structural members, each of the flange members being provided with corrugated surfaces complementary with the corrugated surfaces in respective second and fourth flange portions and being secured to respective second and fourth elongated flange portions in spaced relation therewith to provide tortuous nail receiving grooves therebetween.

2. A corner stud construction as defined in claim 1 in which the flange members associated with the second and fourth elongated flange portions of each of the structural members includes a flange member coplanar with the first and third elongated flange portions and in which the coplanar flange members and the first and second elongated flange portions are adapted to act as

bearing surfaces for respective inner and outer wall surfaces.

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