United States Patent [19]

Klingensmith et al.

[54] CONNECTING BRACKET FOR BUILDING STRUCTURE

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- [52] U.S. Cl..... 52/752, 52/721, 403/400

[56] References Cited UNITED STATES PATENTS

2,700,457 1/1955 Munroe 287/20.95 X

[11] 3,831,338 [45] Aug. 27, 1974

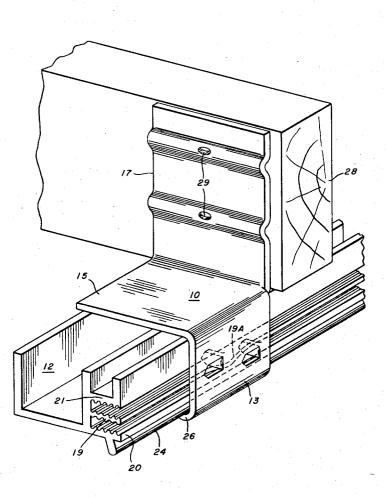
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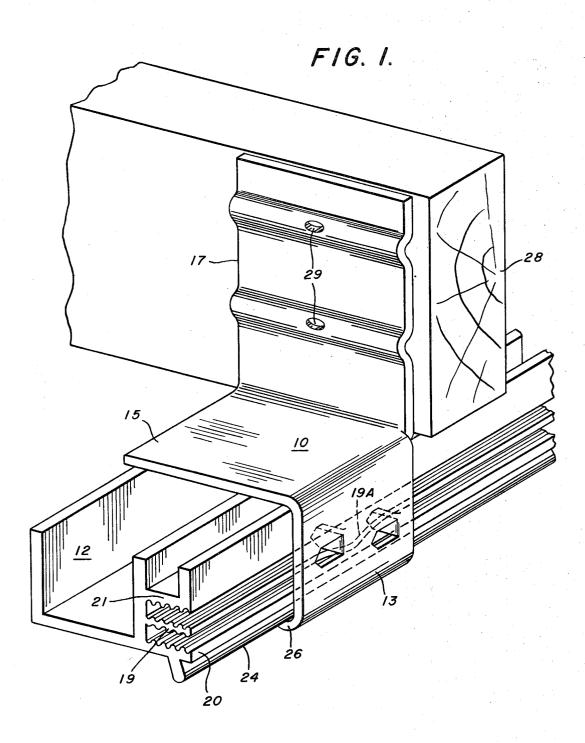
[57] ABSTRACT

A building structure combination in which a bracket is attached to an elongated structural member by a fastening means that engages an integral, transversely extending web portion at at least two spaced apart locations therealong, and on opposed sides thereof, with a force sufficient to deform the web and thereby provide an interference fit between the web and the fastening means.

4 Claims, 2 Drawing Figures



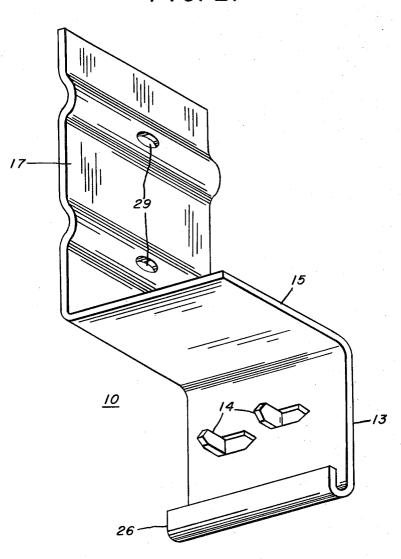
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FIG. 2.



CONNECTING BRACKET FOR BUILDING STRUCTURE

BACKGROUND OF THE INVENTION

The present invention relates generally to metal 5 building structures, and particularly to a bracketstructural member combination in which the bracket is conveniently fastened to one structure member for the purpose of conveniently connecting thereto another structural member.

The interest in metal structural members for constructing the frame of a dwelling house and other building constructions continues at a high level because of a number of factors vital to the building industry. These factors include the essentially endless supply of metal, 15 in comparison to wood, as the basic building material, and the economies involved in being able to continuously produce structural members by fabricating techniques, extrusion processes for example, which techniques and processes can provide metal studding, 20 beams, joists and even siding for buildings in a rapid manner and at low relative cost.

In using such members, it is desirable that they be easily and economically connected together to provide a rugged building construction. For example, in connecting roof trusses or ceiling joists to a horizontally disposed header member, such as that shown in the Klingensmith et al. U.S. Pat. No. 3,633,327, a simple, inexpensive means is needed for the connecting process. 30

BRIEF SUMMARY OF THE INVENTION

The present invention provides such a device in the form of a bracket in combination with a structural member having a transversely extending web portion.³⁵ More particularly, the bracket has a first portion disposed to engage the structural member, and is attached thereto by a fastening means that engages the web portion of the member on opposed sides of the web portion of the member on opposed sides of the web portion at at least two spaced locations lengthwise of the web. The fastening means engages the web in a manner that deforms the web into an S-shaped configuration at the location of the fastening means, as shown in the accompanying drawing. A second, integral portion of the bracket provides a means for attaching another member, such as a truss or joist, to the bracket and thus to the first member.

THE DRAWINGS

The invention, along with its advantages and objectives, will become more apparent from consideration of the following detail description along with the accompanying drawings in which:

FIG. 1 is a perspective front view of a bracket and structural member combination of the invention; and FIG. 2 is a perspective rear view of the bracket of

FIG. 1.

PREFERRED EMBODIMENT OF THE INVENTION

Referring now to the drawings, and in accordance with one embodiment of the invention, a bracket 10 is shown in FIG. 1 connected to an elongated, U-shaped (in cross section) channel member 12, which member may be a structural member of a building construction. A first, channel engaging portion of the bracket comprises a front wall 13 provided with two spaced apart

(and vertically displaced) pointed tabs 14 struck inwardly from the wall, as best seen in FIG. 2. The bracket includes further a top wall 15, which can be considered the main body portion of the bracket, join5 ing the upper edge of the front wall at an angle essentially perpendicular thereto. In addition, the bracket includes a second, integral wall portion 17 extending along another edge of the main wall or body 15, i.e., along an edge adjacent that of the front wall, in a sub-10 stantially perpendicular direction to the plane of the main wall.

The channel member 12 includes an integral, transversely extending web 19 which the tabs 14 engage in a manner presently to be explained. Preferably, the channel member has two additional integral, transversely extending webs 20 and 21, as shown in the drawing, and an integral web or lip 24 angularly depending from the web 20, and extending lengthwise of the channel member 12. The opposed surfaces of the webs 19, 20 and 21 are preferably provided with corrugated surfaces, as shown in FIG. 1.

The lower edge or end of the channel engaging wall portion 13 of the bracket 10 has a curved portion 26 which extends behind and engages the depending web 24 of the channel member when the bracket is properly disposed in place on the front and top of the channel member.

To mount and secure the bracket on the channel member 12, the curved end portion 26 of the bracket is first located behind the depending web 24 of the 30 channel member. The bracket is then rotated about the web and onto the channel member using the depending web as a pivot point and means for the rotation. The curved end of the bracket in engagement with 24 serves to properly locate and register the tabs with the webs 19, 20 and 21 of the channel member. As the bracket is rotated about the lip 24 and onto the channel member, the tabs 14 of the bracket engage the center web 19 of the channel member respectively on opposed sides thereof and deform the same (at 19A in FIG. 1) 40 as the bracket is rotated into full engagement with the channel member. The deformation of the web 19 provides an interference fit between the web and tabs which prevents relative lateral movement between the bracket and the channel member.

To provide the deformation of the web 19 and thus the interference fit in the manner just described and as shown in FIG. 1, the tabs 14 are vertically displaced, as mentioned above, by an amount sufficient to cause the desired amount of deformation. Similarly, the height dimension of each tab is chosen to engage the opposed corrugated surfaces of the webs 20 and 21 to provide additional retaining force on the tabs and thus on the bracket 10.

The web deforming function of the tabs 14 tends to resist movement of the bracket as it is rotated into place. For this reason, a force sufficient to drive the bracket into complete engagement with the channel member needs to be applied to wall 13 of the bracket when joining the same to the channel member. This may be accomplished with the use of an ordinary hammer.

With the bracket secured and fixed on the channel member, as described above, the upstanding portion 17 of the bracket is located to receive thereagainst a second structural member 28 for connecting to the channel member 12. In the drawing, this second member is

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shown as a solid, rectangular structure, such as a wooden beam, joist or truss member, which may be secured to the bracket by driving nails (not shown) through openings 29 provided in the wall portion 17. The member 28 may also be metal, in which case it can 5 be secured to the portion 17 of the bracket by such means as screws, rivets or welds.

It can be appreciated that if the channel member 12 is a horizontally disposed building component (as shown in FIG. 1), floor joists or roof rafters (28) can 10 a lesser degree of holding force. be easily and quickly attached to the channel member, at any desired location therealong, by properly locating and fastening the brackets 10 along the channel member in the simple manner described above. This is accomplished without separate fastening hardware. The 15 channel member itself is simply employed as is, i.e., the channel member may be used as extruded (after it is cut into appropriate lengths). The interference fit provided at 19A insures a rugged, permanent connection between the two members 12 and 28, and thus provides 20 said structural member, and fastening means associated a high degree of holding force between the two.

In addition to the assembly functions that the curved portion 26 of the bracket 10 performs in rotating the bracket and registering the tabs 14 with the webs of channel 12, the curved portion, in extending beneath 25 and behind the depending web 24 of the channel, also resists upward forces on a roof structure if the brackets are used to attach roof trusses to the channel 12. Such forces are created under certain air current and wind conditions. Further, such a bracket structure and as- 30 member to the bracket and thus to the first structural sembly resists any inward and outward movement of building walls employing channels 12 as a structural part thereof.

The integral tabs 14 are the preferred fastening means of the invention though other fastening means 35 may be employed. A simple U-shaped staple might be used by directing the same through appropriately spaced and vertically displaced holes provided in the wall 13 of the bracket, and by driving the staple into engagement with the webs 19, 20 and 21, with the use of 40

a hammer.

The invention has thus far been described in terms of at least two tabs 14 engaging and deforming a center web 19 of a channel member 12 into an S-shape to provide a rugged connection, and thus good holding force, between members 12 and 28. A single tab, however, might be used to engage and deform the web portions of a U-shaped channel, having a depending web 24, though such a single tab would understandably provide

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While the invention has been described in terms of preferred embodiments, the claims appended hereto are intended to encompass all embodiments which fall within the spirit of the invention.

Having thus described our invention and certain embodiments thereof, we claim:

1. In combination with a first elongated structural member having an integral, transversely extending web, a bracket disposed in contacting engagement with with said bracket engaging the web of said member on opposed sides thereof at at least two spaced apart locations therealong, the engagement of the web portion by the fastening means being effective to deform the web to provide an interference fit between the web and fastening means.

2. The structure of claim 1 in which the bracket comprises a portion for engaging the first structural member and a portion for fastening a second structural member.

3. The structure of claim 1 in which the fastening means are tabs struck from a wall portion of the bracket.

4. The combination of claim 3 in which the first structural member has an integral depending web, and the wall portion of the bracket has a curved end extending behind the depending web with the bracket properly located on the structural member. * *

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