

Puccio

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[51] **Int. Cl.**..... **E04c 3/07**

[57] **ABSTRACT**

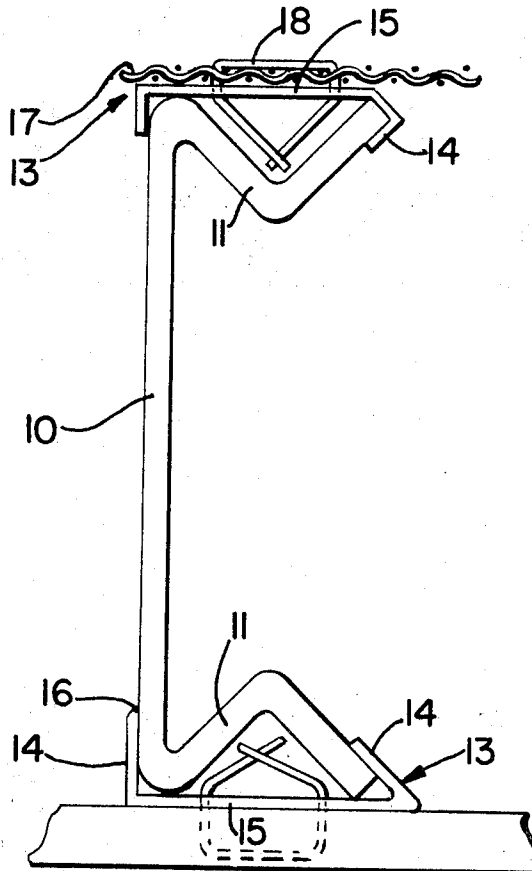
A metal stud assembly is disclosed which includes a load-bearing element consisting of a web and at least one flange with the flange bent from the same sheet of metal as the web and bent into a V-shaped cross section. A sheet-holding element is fixed to the flange, the sheet-holding element being penetrable by connectors for sheet material.

5 Claims, 5 Drawing Figures

References Cited

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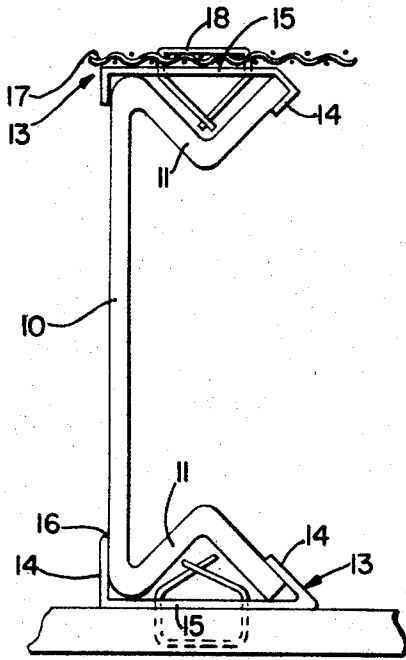


FIG_2

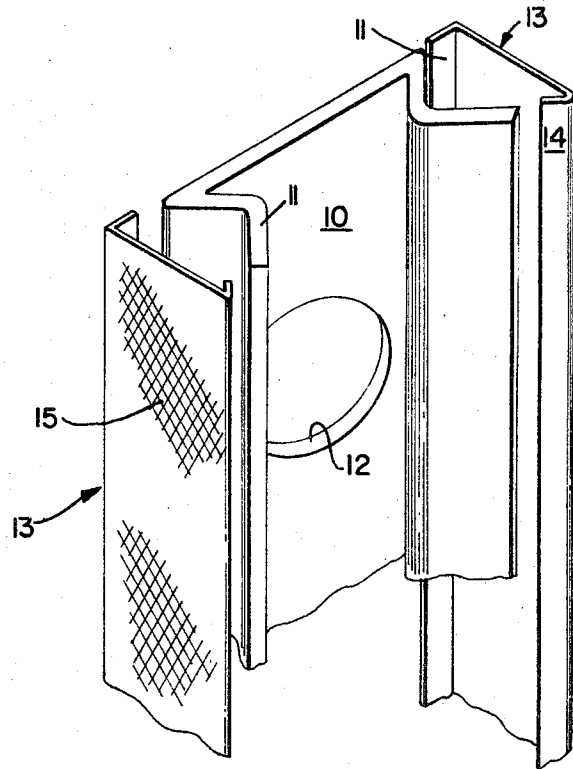


FIG_1

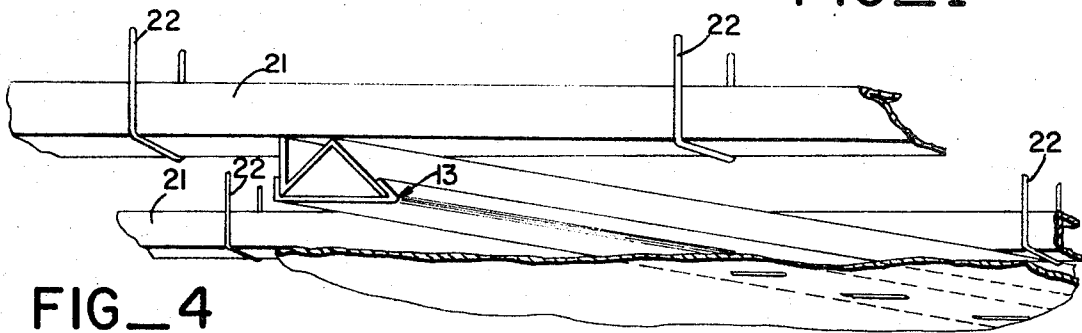


FIG_4

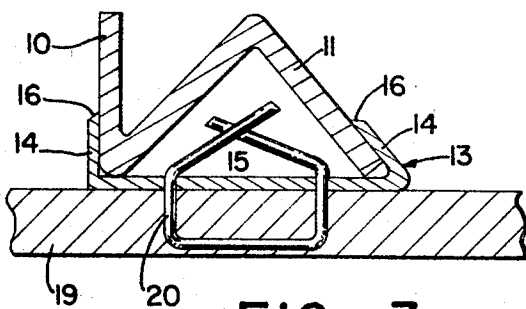


FIG_3

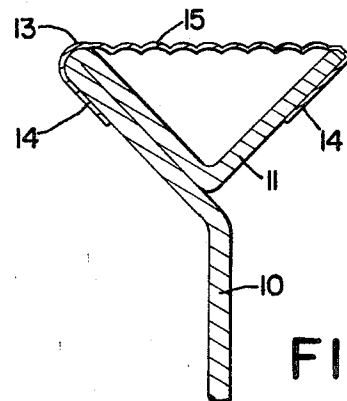


FIG_5

METAL STUD ASSEMBLY

BACKGROUND

In modern construction the use of wooden members such as wall studs and furring strips to hold sheet material is expensive and requires much individual adaptation. Metal studs are strong, inexpensive and uniform in strength and form and are therefore capable of standardized installation techniques. The term *stud* is used herein to describe all sheet-holding structural elements. A difficulty with the use of metal studs is that sheet material such as wallboard, paneling or lathing cannot be connected to the metal studs by simple nailing. Self-tapping screws or other metal-penetrating fasteners are expensive to purchase and install, and savings realized in the purchase and installation of metal studs are frequently lost in the effort of fixing sheet material to the studs.

THE INVENTION

This invention avoids or greatly mitigates the problems set forth above by providing a metal stud with all the advantages of metal studs, but one to which sheet material is easily attached by nailing or by procedures that are easier and more satisfactory. The metal stud of this invention includes two elements: a load-bearing element and a sheet-holding element. These elements coact to produce the desirable results obtained.

The load-bearing element consists of a strong metal element bent into a web and at least one flange. The web is, in cross section, a straight element lying in a plane, while the flange is bent to a V-shaped cross section. The ends of the legs of the V-shaped flange lie in the same plane and diverge to open away from the web. The plane in which the divergent extremities lie forms a boundary of the cross section of the load-bearing element.

The sheet-holding element is formed to be affixed to the load bearing element in contact with the portions of the flange constituting the ends of the diverging legs of the V. The sheet-holding element is of lighter gauge than the load-bearing element, and it is made of material that can be penetrated by the connectors for fasteners to be used to hold the sheet material to the stud. Preferably, the surface of the sheet-holding element is irregular in order to engage a connector to prevent slippage of the point of the connector while it is driven. A knurled or dimpled surface may be employed. A surface that is dimpled and slightly penetrated at the bottom of each dimple may also be used.

The sheet-holding element may be connected to the load-bearing element by any suitable means, including but not limited to spot welding, crimping, friction or riveting, to mention a few. Sheet material may be connected to the stud assembly by driving a variety of fasteners through the sheet holding material. Nails, particularly with circumferentially slotted shanks may be employed, but staples are preferred. Whatever fastener is used, when driven through the sheet-holding element, it will contact the sloping wall of the V-shaped flange and will be bent to form a crimped connection with the stud assembly. Opposite legs of a staple will engage opposite walls of the V-shaped flange and will be crimped toward each other to make a particularly snug connection.

The invention can be best described with reference to the accompanying drawings which illustrate structures embodying the invention.

FIG. 1 is an exploded perspective view of a stud assembly embodying this invention with portions cut away.

FIG. 2 is a plan view of a stud assembly of this invention having expanded metal lath affixed to one side of it and wall board affixed to the other side.

FIG. 3 is an enlarged partial sectional view of the flange of FIG. 2 that has wall board affixed to it.

FIG. 4 is a perspective view partly in section of a specially adapted stud assembly of this invention employed as a furring strip to hold sheet material to form a ceiling.

FIG. 5 is a partial sectional view of a different stud assembly embodying this invention.

The same reference numeral is employed in all views to identify the same element.

In FIG. 1 there is illustrated stud including a web 10 having flanges 11 attached to each end. The web also includes an opening 12 for convenience in passing utility supply means through the walls that the studs support. Each of flanges 11 are V-shaped having their vertices pointing toward each other and having the extreme edges of their legs lying in planes approximately perpendicular to the plane of web 10.

A sheet-holding element 13 is formed to co-operate with each flange 11. FIG. 1 illustrated the elements 13 in exploded perspective view while FIGS. 2-5 inclusive show elements 13 assembled in cooperation with flanges 11. Element 13 preferably has bent portions 14 which engage the flange so that a sheet material connecting surface 15 lies in a plane perpendicular to the plane of web 10. As best shown in FIG. 3, the element 13 may be attached to flange 11 by spot welds 16, but any other suitable fastening means may be employed. The surface 15 may be knurled, dimpled or otherwise contoured to be irregular as illustrated in FIG. 1 to facilitate driving connectors through the element 13 by engaging their points to prevent slipping.

FIGS. 2 and 3 best illustrate how sheet material is attached to the studs of this invention. In FIG. 2 expanded metal lath 17 is positioned in contact with surface 15 and staple 18 is driven through lath 17 and element 13. When the legs of staple 18 contact the sloping interior surfaces of flange 11 they are bent inward bending sharply at the underside of element 13 and crimping tightly so that lath 17 is held firmly in place.

FIG. 3 is an enlarged illustration of the other flange of FIG. 2. In FIG. 3 wall board 19 is connected to the stud assembly by staple 20. The staple 20, when driven mechanically, may be adapted to pass so quickly through the wall board 19 and element 13 that it becomes embedded beneath the surface of wall board 19. The high-energy driving of staples also crimps them more firmly in that the inertia of the staple legs caused by abruptly contacting the sloping walls and rapidly changing direction causes them actually to cross each other and be completely out of contact with the sloping walls of flange 11. Particularly when installing wall board it is desirable for the connectors to embed themselves into the board to facilitate normal plastering and taping finishing procedures.

FIG. 4 illustrates the stud assembly of this invention used as a furring strip to hold a ceiling. In FIG. 4 joists 21 are supported in a horizontal position by suitable

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hangers 22. The stud assembly of this invention used as a furring strip preferably is formed with the vertex of the V-shaped flange 11 and the end of the web 10 lying in the same plane. A number of such stud assemblies are attached, suitably spaced to the joists 21; and ceiling surface sheet material, such as wall board, is connected to the furring strips by driving staples vertically upward through the wall board and the element 13.

FIG. 5 illustrated another element of this invention. In the embodiment of FIG. 5 the unitary load-bearing element is bent so that web 10 is aligned with the vertex of the V-shaped flange 11. In this embodiment one leg of flange 11 is doubled back on itself. The advantage of this construction is that it is symmetrical and is less likely to distort due to eccentricity when subjected to loads. Another advantage of the configuration of FIG. 5 is that the legs 14 of element 13 can be crimped over both legs of flange 11 and be held to the flange by friction or pressure alone. FIG. 5 also illustrates a suitable dimpled contour of surface 15.

Many variations of the concept described herein may be made within the scope of this invention. The element 13 may be plastic or other durable but penetrable material and it may be fixed by adhesives to the load-supporting element. The load-supporting element may have many different cross sections and it may be formed in many ways such as being bent from a single sheet or multiple sheets riveted through the web, or formed by rolling, forging, casting, extruding or other processes.

What is claimed is:

1. A metal stud assembly comprising: a load-bearing

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element including a longitudinally extending web and at least one flange extending from one edge portion of said web and from one surface thereof and coterminous with the length of the web, said flange having a V-shaped cross section the divergent extremities of which lie in a plane substantially perpendicular to the plane of the web and forming the boundary of said load-bearing element, the apex of said V-shaped flange being offset from the plane of said web and disposed inwardly of said edge portion of said web, and a sheet-holding element fixed to the flange in contact with said divergent extremities and forming a plane surface substantially perpendicular to the plane of the web, said sheet-holding element surface being knurled and penetrable by connectors for sheet material.

2. The assembly of claim 1 wherein the sheet-holding element surface is knurled substantially uniformly over the entire surface thereof.

3. The assembly of claim 1 wherein said load-bearing element is formed from a single sheet of metal and in which the lugs forming said flange define an included angle of about 90°.

4. The assembly of claim 1 wherein said web is provided with a flange at each edge portion thereof, with each of said flanges extending from the same surface of said web. 5. The assembly of claim 1 wherein the sheet-holding element is fixed to the flange and to the adjacent edge portion of said web.

5. The assembly of claim 1 wherein the sheet-holding element is fixed to the flange and to the adjacent edge portion of said web.

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