

Sept. 18, 1945.

E. D. PIERI ET AL

2,384,849

STRUCTURAL MEMBER

Filed June 23, 1943

Fig. 1

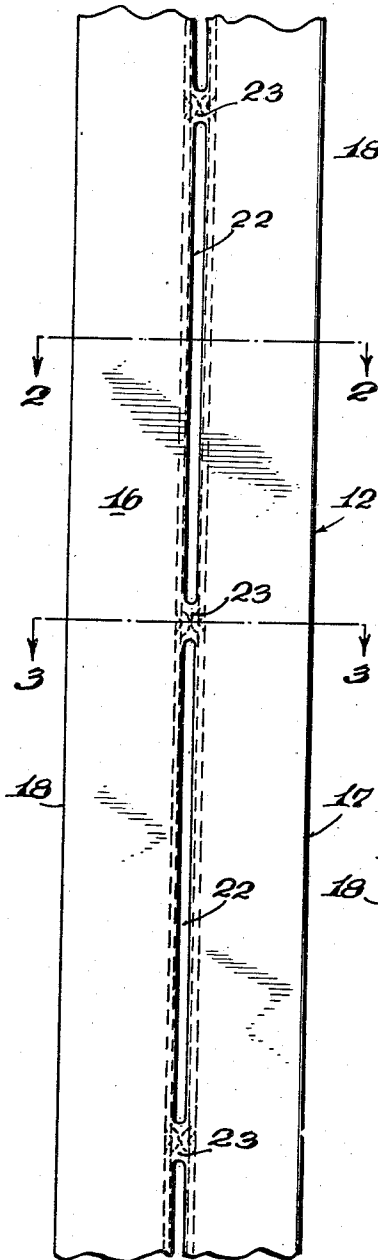


Fig. 2

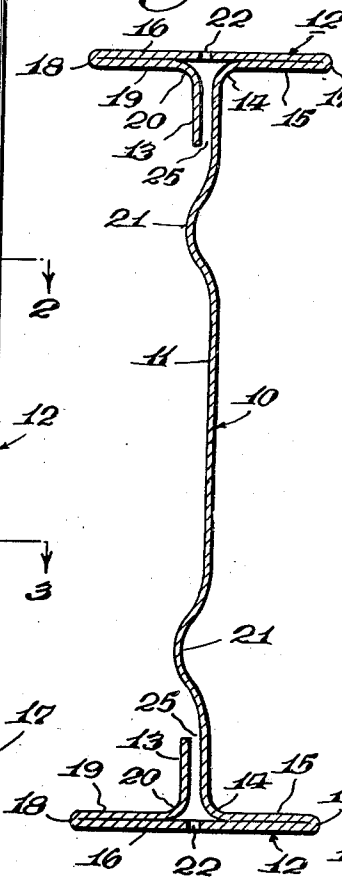
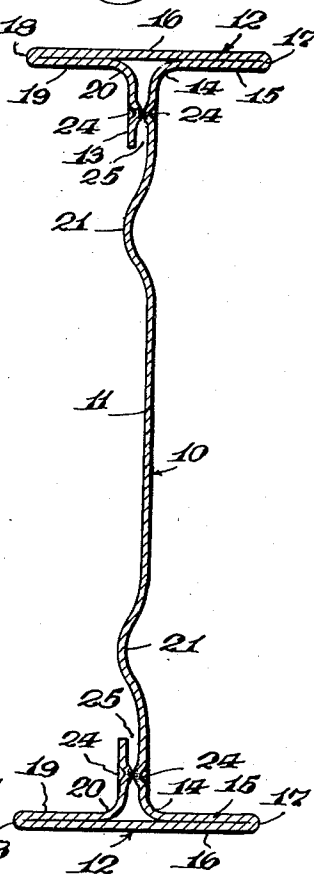


Fig. 3



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UNITED STATES PATENT OFFICE

2,384,849

STRUCTURAL MEMBER

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Application June 23, 1943, Serial No. 491,980

4 Claims. (Cl. 189—37)

The present invention relates to improvements in structural members formed from sheet metal. More specifically, the present invention relates to sheet metal structural members having provision for receiving and retaining nail-like elements for construction purposes.

In recent years there has been an increasing amount of light steel framing used for construction purposes. In this type of framing, structural members cold formed from hot or cold rolled steel strip are substituted for wood members or the old fashioned hot rolled steel structural members. Where the structural members are substituted for wood the type of construction usually calls for nailing of flooring, furring, sheathing, etc. to the structural members constituting the frame in order to arrive at a completed structure. There have been many types of structural members evolved which present means of one type or another for receiving and retaining nail-like elements. An ever present problem in this type of structure has been the relative expense of the metal structural members to the wooden counterparts. Improved methods for hot rolling and cold rolling steel strip have in recent years reduced the amount of steel necessary in the cold formed steel structural members, while at the same time obtaining even greater strength. The problem remaining is confined to economical and efficient fabrication of the structural members. The present invention provides a form of structural member which is the essence of simplicity relative to fabrication methods and at the same time presents the requisite strength with the lightest possible gauge of metal.

It is to be understood that although steel is specifically referred to herein, any other metal practical and economical under the circumstances of use will be just as suitable.

An important object of the present invention is the provision of an improved sheet metal structural member formed from a single sheet of metal.

A further important object of the present invention is the provision of an improved sheet metal structural member having novel nail-like element retaining features.

Other objects and advantages of this invention will be apparent from the following detailed description and the accompanying drawing, in which

Figure 1 is a plan view of the bearing surface of a structural member embodying the present invention,

Figure 2 is a view in section taken on the line 2—2 of Figure 1, and

Figure 3 is a view in section taken on the line 3—3 of Figure 1.

The structural member of the present invention is formed from a metal sheet or strip indicated generally at 10. In the embodiment shown in the drawing, the metal sheet is bent to form a structural member having an I-shape section. It will be apparent that a T-shape section is included in the showing presented by the drawing and the term web member as used herein is intended to include the meaning of the term leg member as applied in the art to such a shape. Any other desirable structural shape can be employed within the limits of the invention as defined by the appended claims.

The embodiment shown in the drawing includes a web section 11, a head member indicated generally at 12 and a nail guiding element 13. The metal sheet has a bend at 14 which presents a portion 15 of the metal sheet extending out to the margin of bearing surface 16 of the head member, which margin is defined by bend 17. The other margin of bearing surface 16 is defined by bend 18 presenting a portion of the metal sheet 19, which merges into element 13 at bend 20. Bends 17 and 18 need not necessarily be flat as shown. A bead 21 or any other suitable nail deforming means formed in web 11 extends longitudinally of the structural member. In the use of a bead as shown, a reinforcing function is present. Bearing surface 16 may be perforated along its length preferably in the form of slits 22. Bridge portions 23 in bearing surface 16 define the ends of slits 22. Nail guiding element 13 and web 11 may be held in proper spaced relation by spacing members herein shown as dimples 24. Where desired, such spacing members may be connected as by the spot welding shown. Bridges 23 and spacing means 24 are positioned so as to coincide, thus leaving an unobstructed nailing groove 25 between element 13 and web 11 along the length of each slit 22.

Preferably, slit 22 has a width smaller than the width of the nailing groove 25. Thus a nail driven into the slit 22 will distort the metal at that point to hold the nail against longitudinal movement in the slit. As the nail is driven down and through nailing groove 25, it encounters nail deforming means 21 and its lower end is bent, thereby clinching it in position.

The term nailing groove as used in this specification and appended claims is intended to describe a structural relationship known in the art. As evidenced by the patent to Loucks—1,964,403, Bowen, 2,250,253, and Hull, 2,257,338 and 2,276,040,

this relationship comprises a pair of closely spaced surfaces which form a slot or recess to receive a nail and which surfaces act together to guide the nail in a plane parallel to the web member into a nail deforming means.

A structural element embodying the present invention may be cold formed or shaped in any other suitable manner from a single strip of metal. The forming operation including the formation of nailing groove 25 and even the fastening of nail guiding element 13 to a web 11 may be performed in one machine. Thus in the case of steel, hot or cold rolled strip can be continuously fed from a coil to a cold forming machine which forms the necessary bends and spacing members 24 to produce a completed continuous structural member to be sheared into required lengths.

We claim:

1. A structural member formed from sheet metal comprising a section presenting a web member, a head member integral therewith formed by bends in the sheet metal, first at an angle to the web member, then in the reverse direction back on itself in supporting relation to form a bearing surface, then in the same direction back toward the web member, then in a direction to present a nail guiding element spaced from the web member to form a nailing groove therebetween, means attaching the nail guiding element to the web member at points along the length of the web member spaced from the last described bend, and means acting between the nail guiding element and the web to deform a nail driven into the nailing groove.

2. A structural member formed from sheet metal comprising a section presenting a web member, a head member integral therewith formed by bends in the sheet metal, first at an angle to the web member, then in the reverse direction back on itself in supporting relation to form a bearing surface, then in the same direction back toward the web member, then in a direction to present a nail guiding element spaced from the web member to form a nailing groove therebetween, perforations in the bearing surface coinciding with the nailing groove, means attaching the nail guiding element to the web member at points along the length of the web member spaced from the last described bend, and means acting between the nail guiding element and the web to deform a nail driven into the nailing groove.

3. A structural member formed from sheet metal comprising a section presenting a web member, a head member integral therewith formed by bends in the sheet metal, first at an angle to the web member, then in the reverse direction back on itself in supporting relation to form a bearing surface, then in the same direction back toward the web member, then in a direction to present a nail guiding element having portions spaced from portions of the web to form a nail receiving slot extending along the web member, means connecting the nail guiding element to the web member at points along the web member spaced from the head member, a nail directing means extending along the bearing surface in alignment with the nail receiving slot for directing a nail through the bearing surface and into the slot, nail clinching means acting between the nail guiding element and the web member to deform the nail, said portions of the nail guiding element and web member being spaced a distance such that said portions coact each with the other to guide a nail from said nail directing means to said nail clinching means.

4. A structural member formed from sheet metal comprising a section presenting a web member, a head member integral therewith formed by bends in the sheet metal, first at an angle to the web member, then in the reverse direction back on itself in supporting relation to form a bearing surface, then in the same direction back toward the web member, then in a direction to present a nail guiding element having portions spaced from portions of the web to form a nail receiving slot extending along the web member, means connecting the nail guiding element to the web member at points along the web member spaced from the head member, perforations extending along the bearing surface in alignment with the nail receiving slot for directing a nail through the bearing surface and into the slot, nail clinching means acting between the nail guiding element and the web member to deform the nail, said portions of the nail guiding element and web member being spaced a distance such that said portions coact each with the other to guide a nail from said perforations to said nail clinching means.

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