Sept. 8, 1931. G. A. BELDING 1,822,558

MEANS FOR FASTENING CORRUGATED SHEETS AND THE LIKE

Filed Aug. 2, 1929

Fig. 1.

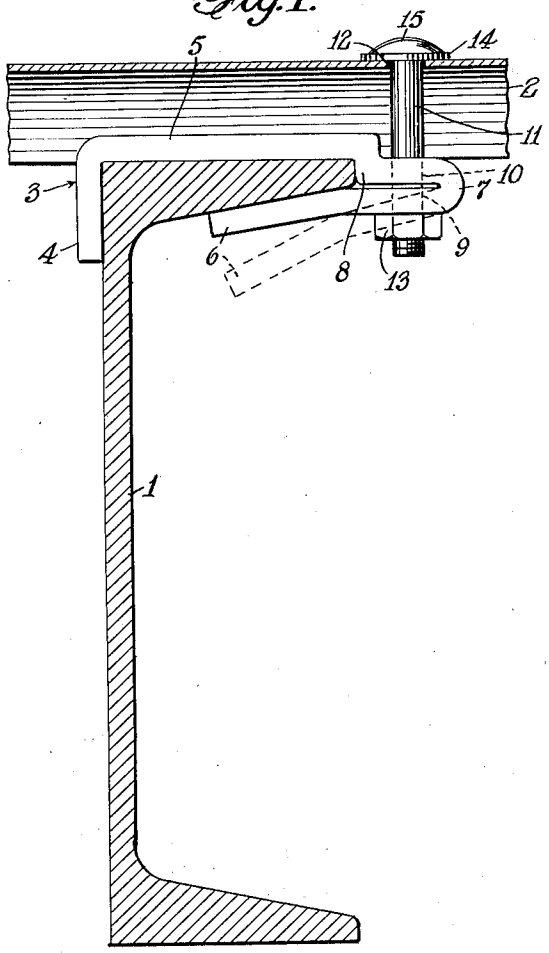


Fig. 3.

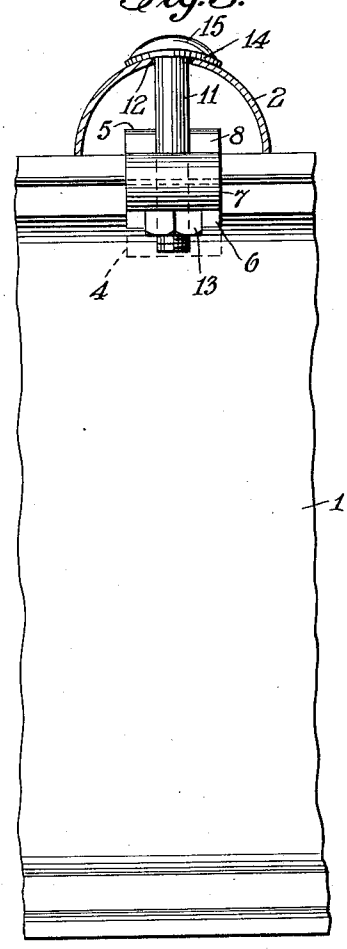
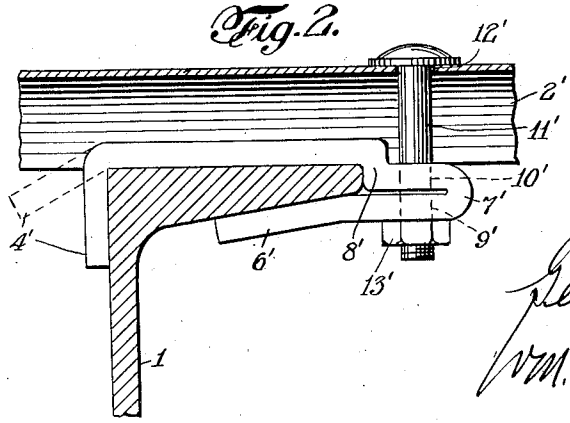


Fig. 2.



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UNITED STATES PATENT OFFICE

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MEANS FOR FASTENING CORRUGATED SHEETS AND THE LIKE

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This invention relates to means for fastening sheets to structural elements and more particularly to a clip for fastening sheets such as corrugated metal sheets, sidings, and the like, to beams, girders, purlins, Z-bars and the like.

Prior to this invention many devices for securing sheets to structural elements have been devised. One commonly used consisted of a clip formed of a strip of metal having bendable end portions whereby the two flanges of the beam or purlin were engaged. This strip usually held rivets on top of the purlin and it was by means of these rivets extending through holes in the sheets that the latter were fastened. In laying the sheets, the purlins were first provided at proper intervals with clips, that is, the strap was disposed on and the rivets extended through the strap projecting from the top of the purlins. The sheets having holes adapted to receive the rivets were then placed in position and the projecting shanks were upset to clamp the sheets. In these clips it was necessary to first position the rivets in the strap on the purlins. Due to the fact that rivets were inserted with their shanks upstanding, they ofttimes fell out of the holes in the strap. This, in addition to the tedious work involved in the proper insertion of the rivets, caused great inconvenience. Furthermore, the upsetting of the rivets had a tendency to loosen the clips, thereby reducing their effectiveness.

I have found that I can overcome the above-mentioned defects by providing a fastening means comprising a clip having its end portions adapted to engage a structural element together with a portion extending beyond the edge of the structural element having means therein to receive a fastening element cooperating with the sheet to be fastened.

It is therefore an object of this invention to provide means for fastening sheets to structural elements, said fastening means comprising a clip having its end portions adapted to engage a structural element, said clip being provided with a laterally extending portion having means therein to receive a fastening element cooperating with the sheets to be fastened.

Another object of this invention is to provide a clip having its end portions adapted to engage a structural element, one of said end portions being shaped to conform to the portion of the structural element which it is adapted to engage, the other end being bendable and adapted to be forced into its position on the structural element, and a laterally extending portion adapted to receive a fastening element cooperating with the sheet.

Other objects will appear from the following description, appended claims and accompanying drawings forming part of this specification and in which:

Figure 1 is a side elevation illustrating one modification of a clip constituting this invention and applied in position, the structural element and sheet being shown in section.

Figure 2 is another modification of a clip constituting this invention and applied in position, the structural element and sheet being shown in section.

Figure 3 is a side elevation of Figures 1 and 2 when viewed from the right.

Referring now to the drawings wherein like reference numerals designate like parts, the reference numeral 1 designates a purlin to which a corrugated sheet 2 is to be fastened. Though the drawings illustrate purlins and corrugated sheets, it is to be understood that the invention is not limited thereto and sheets of any nature used in building construction may be secured to any structural elements, such as beams, girders, etc. The sheet 2 is fastened to the purlin 1 by means of a clip 3 made from a flat bar, strip or plate of any suitable metal such as aluminum or aluminum alloy. One end 4 of the clip 3 is bent at right angles to the top 5 thereof and is adapted to engage the web of the purlin 1. The other end portion 6 is adapted to engage the lower surface of the top flange of the purlin. To attain this the clip is formed with a loop 7. Spaced from the end 4 a distance approximately equal to or greater than the width of the purlin which the clip is

adapted to engage is a shoulder 8 offset with respect to the top of the clip, and is adapted to be spaced from or preferably engage the vertical edge of the purlin flange as desired. The overlapping portions forming the loop 7, as illustrated in the drawings, extend laterally from the shoulder 8 and is provided with two holes 9 and 10 adapted to align when in use.

In the manufacture of this clip, the end portion 4 is bent at right angles to the top of the clip, thereby conforming to the web of the purlin. The other portion, after the holes 9 and 10 have been drilled therein, is shaped to provide the shoulder 8 and then bent into the position illustrated by the dotted lines in Figure 1. To apply the clip it is only necessary to slip it under the purlin flange and force up the end 6 with a hammer, maul, etc., until it bears on the inside surface of the flange illustrated in Figure 1 by the full lines. The two holes 9 and 10 align themselves and offer a seating surface which is substantially parallel to the flange. A bolt 11 is then inserted in the hole 12 in the sheet 2 positioned so that it aligns with the holes 9 and 10, after which a nut 13 is screwed on the threaded shank of the bolt, whereby the sheet 2 is fastened. If desired, a washer 14 of any suitable material such as soft aluminum may be used beneath the bolt head 15. The bolt head 15, may, in case corrugated sheets are used, be formed with a head which conforms to the crest of the corrugation when the nut is drawn up. It is to be understood that any other fastening means such as rivets, pins, etc. may be used instead of the nuts and bolts hereinbefore described. The construction just described and illustrated makes it possible to obtain a direct pull on the corrugated sheet.

The clip illustrated in Figure 2 is a modification of that illustrated in Figure 1. When applied in place, the clip is similar to that illustrated in Figure 1. It is provided with a loop 7′, the overlapping portions thereof extending laterally from a shoulder 8′ and together with the holes 9′ and 10′ in the overlapping portions similarly to the clip illustrated in Figure 1. It differs, however, in that the end portion 6′ is formed to conform to the lower surface of the flange and the end portion 4′ is adapted to be bent in position on the purlin. In applying the clip illustrated in Figure 2, it is slipped over the flange of the purlin, the end portion 6′ engaging the lower surface of the flange of the purlin. The end 4′ will assume the position shown in the dotted line in Figure 2. After the clip has been disposed on the purlin, the end 4′ is forced into the full line position shown in Figure 2, whereby the clip securely engages the purlin. A bolt 11′ is inserted through the hole 12′ in the corrugated sheet 2′ and the holes 9′ and 10′ in the laterally extending portion of the clip, after which a nut 13′ is screwed on the threaded shank thereof.

The individual clips above described may also be made by transversely cutting a solid extruded form of some length and having the desired cross-section. Preferably, the extruded clip section would take the form of the clip illustrated in Figure 1, the loop end 7′ being formed integrally with the shoulder portion 8′ to conform to the purlin flange and the portion 4′ extending horizontally or angularly as shown. Individual clips cut from such a section would only necessitate drilling of the holes 10′ to receive the clamp bolt 11′. The mounting of the purlin is obtained by bending the free end 4′ at right angles to conform with the web of the purlin and as above described.

The clips above described are simple and cheap to manufacture. The mode of application is very easy and in use the clips are substantially free from any looseness and are very effective. By virtue of the shoulder, the clips may be made in predetermined standard sizes, whereby they may be used with structural elements of corresponding sizes. Due to the combination and structure of the various parts, there is obtained a direct pull which results in a secure fastening.

Since it is obvious that various changes may be made in the specific details above set forth without departing from the nature of the invention, this application is not limited thereto except as defined in the appended claim.

I claim:

A fastening device for securing sheets to purlins or the like comprising end sections, one of said end sections being adapted to engage the web of the purlin and the other being adapted to engage the under surface of the flange of said purlin, one of said end sections being normally shaped to conform to the part of the purlin which it is adapted to engage, the other being adapted to be forced in position, an intermediate body member adapted to engage the upper surface of the purlin and having a shoulder normally shaped and adapted to contact with the vertical edge of the flange, the body member adjacent said shoulder and the end which engages the under surface of the flange extending laterally and being looped and provided with a hole to receive a single sheet retaining element.

In testimony whereof I have affixed my signature to this specification.

GEORGE A. BELDING.