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G. E. BLACK
FASTENING DEVICE OR CLIP

1,889,770

Filed April 13, 1929

Fig. 1.

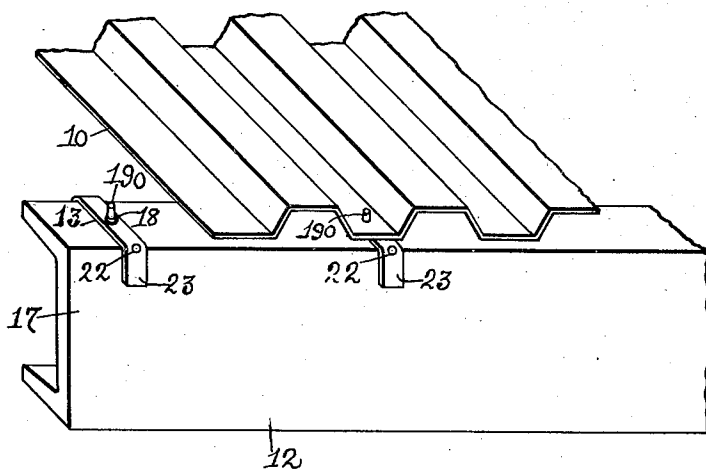


Fig. 2.

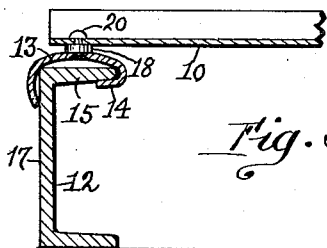
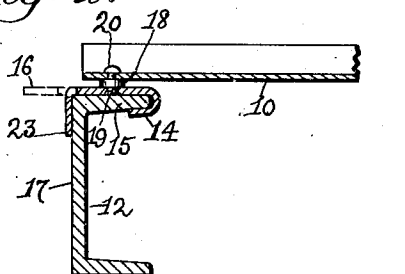
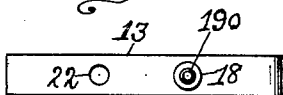


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE

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FASTENING DEVICE OR CLIP

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This invention relates to a fastening device or clip for attaching metal sheets and particularly corrugated metal sheets which form the roof and side walls of buildings or like structures, to the steel frame or supporting members of the building to which the metal sheets are usually riveted.

The invention has for its object to provide a fastening device or clip with which the metal sheets may be more firmly secured to and solidly supported by the purlins or like metal members of the steel framework.

To this end the clip is constructed as will be hereinafter described.

Fig. 1 represents a portion of a metal roofing sheet which is to be secured to a roof purlin by clips embodying this invention;

Fig. 2, a section showing the metal roofing sheet riveted to the purlin;

Fig. 3, a section like Fig. 2 to illustrate the advantage of the improved clip, and

Fig. 4, a plan of the clip shown in Figs. 1 and 2.

Referring to the drawing 10 represents a corrugated metal sheet, which is represented as plain metal but which may be of protected metal such as now largely used in buildings and like structures.

The metal sheet 10 is secured to the metal supporting member 12, shown as a channel bar, by clips embodying this invention.

Each clip consists of a relatively short metal bar 13 bent at its front end to form a hook 14 for engaging the upper flange 15 of the purlin or metal supporting member 12.

The metal bar 13 is made of a length greater than the width of the flange 15 so as to project beyond the vertical web or member 17 of the purlin as represented by dotted lines in Fig. 2.

The metal bar 13 has extended from its upper surface a rivet blank 18 having the lower portion 19 of its shank extended through a hole in the bar 13 and riveted against the lower surface of said bar, and having the upper portion 190 of its shank preferably made tapering and of sufficient length to project above the metal sheet 10 and form the head 20 of the rivet.

The projecting rear end 16 of the bar 13 is

designed to be bent down to engage the vertical or web member 17 of the channel bar 12, which is accomplished in practice by the workman hammering the projecting portion 16 of the bar 13 into engagement with the vertical member or web 17 of the channel bar before the head 20 on the rivet is formed.

It is highly desirable that when the head 20 of the rivet is formed, the portion of the bar 13 from which the rivet stud 190 projects, should make extended contact with the upper flange 15 of the purlin or channel bar 12, and that the projecting rear end portion 16 of the bar 13, indicated by dotted lines in Fig. 2, should make close and firm contact for its entire length with the vertical member or web 17 of the purlin, so that the bar 13 and metal sheet 10 may be immovable on the purlin when the head 20 of the rivet is being formed.

To accomplish these results, the bar 13 is provided with a hole or opening 22 through it, which is located with respect to its hooked end so that when the hooked end is engaged with the flange 15 of the purlin and driven home, the said opening will be in close proximity to the corner formed by the flange 15 and web 17 of the purlin, and preferably with the center of the opening 22 substantially in the same plane as the outer surface of the web 17, and said opening will be between the side edges of the bar 13 as represented in Fig. 4, so that when the projecting end 16 of the bar 13 is hammered down by the workman, it will bend about the corner of the purlin and be engaged for its entire length with the web of the purlin without disturbing the relation of the bar 13 with the upper surface of the purlin, as clearly shown in Fig. 2.

By reference to Fig. 2, it will be seen that the clip is in firm contact throughout its entire length with the purlin and is firmly anchored thereto by the hook at one end and by the flange 23 at the other end, which flange is formed from the end portion 16 and shaped by the web portion of the purlin.

By locating the opening 22 between the side edges of the bar 13, the flange 23 is capable of being formed and engaged with the

web 17 without breaking or rupturing the tough outer surface or skin of the bar 13 and therefore without weakening the same.

In Fig. 3 is illustrated a clip of the same stock as the clip shown in Fig. 2, but without the opening 22, and the disadvantages of such a clip are illustrated, for by reference to Fig. 3, it will be observed that the portion of the clip above the purlin is bowed and does not contact with the purlin throughout its length as in Fig. 2, and consequently provides an insecure fastening for the roofing sheet.

Furthermore the depending flange 23 is also bowed and if hammered so as to contact with web 17 of the purlin, the tough outer skin of the bar from which the clip is formed, is liable to be ruptured and the flange 23 broken off by the hammering to obtain contact of the flange 23 for its entire length.

These objections are avoided by providing the bar with an opening 22 between its side edges and located at such point in its length as to have the opening in close proximity to the corner of the purlin and preferably with the center of the opening in the plane of the outer surface of the web 17 of the purlin as illustrated in Fig. 2.

The head 20 is formed on the rivet by a suitable tool in the hands of a workman, which tool may be used to force the sheet 10 onto the rivet stud 190 and then upset the latter to form the head 20, and as the rivet stud 190 is solidly supported or backed up by the purlin, a materially stronger connection between the metal sheet 10 and the clip may be obtained.

The opening 22 is shown as circular in form, which may be preferred, but it is not desired to limit the invention in this respect.

What is claimed is:

A clip of the character described, comprising a flat metal bar having a tough outer skin and bendable with difficulty, said bar being provided at one end with a hook and between its ends with a rivet blank extended from its surface opposite to said hook and having in it between said rivet blank and the rear end of said bar an opening located between the sides of the bar to align with the edge of the support upon which the flat portion of the bar which carries the rivet blank is to rest, whereby the rear portion of the flat bar bendable with difficulty and projecting beyond the edge of said support may be hammered into a position substantially at right angles to the flat portion of the bar resting on the said support without breaking the tough skin of said bar at the bend therein and without disturbing the contact of the flat portion of the bar with the upper surface of said support.

In testimony whereof, I have signed my name to this specification.

GEORGE E. BLACK.