Aug. 15, 1939 P. A. VOIGT 2,169,376

STRUCTURAL ASSEMBLY

Filed Jan. 12, 1938

Fig. 1.

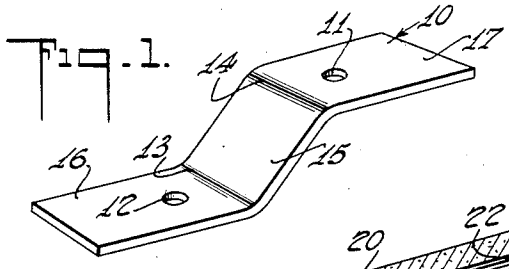


Fig. 2.

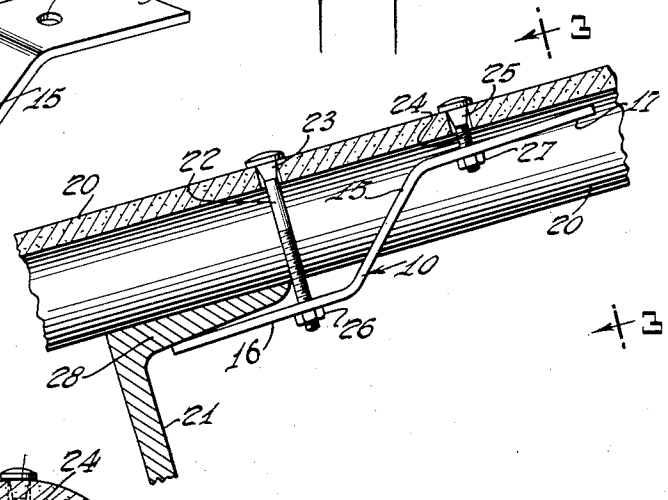


Fig. 3.

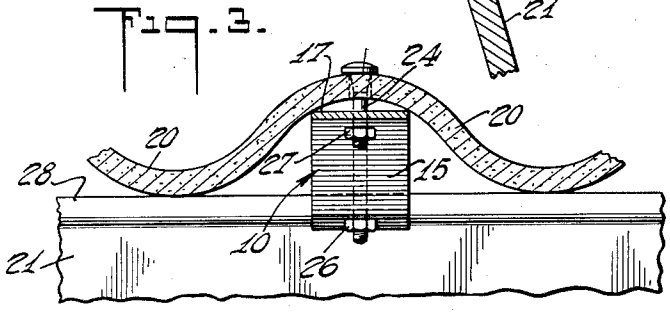


Fig. 5.

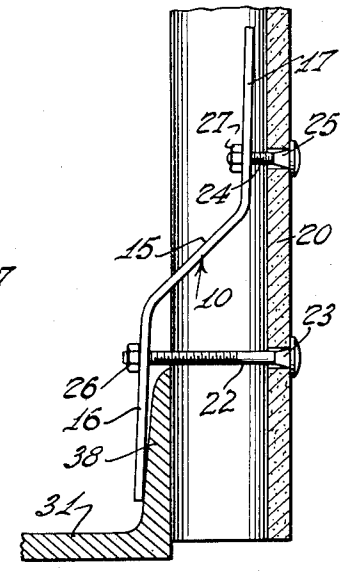
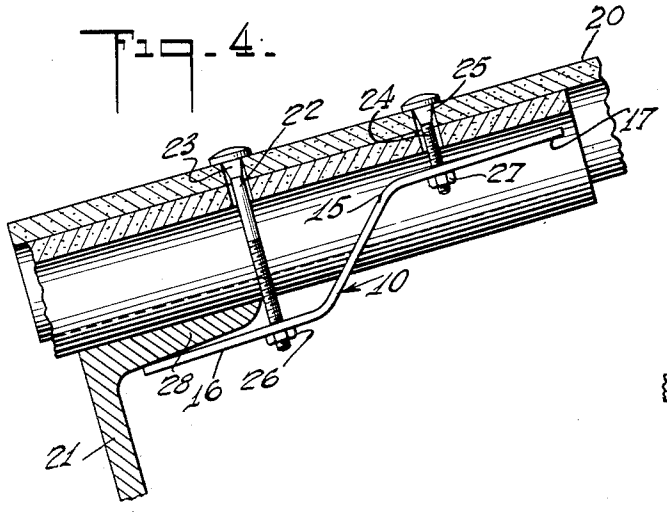


Fig. 4.



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STRUCTURAL ASSEMBLY

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Application January 12, 1938, Serial No. 184,549

2 Claims. (Cl. 108—33)

My present invention relates to an assembly of covering sheets including a supporting structure and means for securing the sheets to the supporting structure. More specifically, my invention relates to a new and improved means for fastening relatively large sheets of corrugated material such as metal, or rigid sheets as, for example, those consisting essentially of asbestos fibres and Portland cement in compressed, densified, and hardened condition, to roof or wall beams.

At the present time, corrugated sheets comprising both those of metal and of the rigid structural compositions referred to above are widely employed as wall and roof coverings. The sheets are normally laid on the supporting structure in such a manner that their corrugations run vertically of the wall or upwardly of the roof, the sheets having their ends overlapping to a sufficient extent to prevent the driving or seepage of moisture to the interior of the building. The supporting structure generally comprises suitable purlins or beams running longitudinally of the wall or roof, certain of the beams preferably lying beneath the overlapping end portions of the sheets, and clips or bolts have been provided to secure the sheets to the purlins or beams.

An object of the present invention is to provide an improved fastener or clip for securing corrugated covering sheets, the fastener being of such configuration that it may be readily applied and, when in place, will exert an effective binding action. A further object of the invention is to provide a structural assembly of corrugated covering sheets and supporting beams including an improved fastening slip of the above-mentioned type which will insure against slippage or raising of the sheets relatively to the supporting beam.

Briefly stated, my invention resides in the combination of corrugated roofing sheets laid in overlapping relationship on supporting beams with clips for securing the sheets to the beams and the clip construction per se. Each clip includes elements adjacent one of its ends acting in cooperation with the body of the clip to secure the same to the supporting beam, and elements adjacent the opposite end of the clip and also acting in cooperation with the body of the clip to bind the same to a roofing sheet.

My invention will be more fully understood and further objects and advantages thereof will become apparent when reference is made to the more detailed description which is to follow and to the accompanying drawing in which;

Fig. 1 is a perspective view of a fastening clip constructed in accordance with my invention;

Fig. 2 is a partial sectional view of a roof structure employing the fastening clip of Fig. 1;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a partial sectional view similar to Fig. 2 illustrating the application of the invention at the overlapping portions of roofing sheets and;

Fig. 5 is a partial sectional view of a wall structure in accordance with the invention employing the fastener of Fig. 1.

Referring to the drawing, and more particularly Fig. 1, a fastening clip 10 is disclosed. The clip 10 comprises a strip of a material such as iron or steel of a suitable thickness to have the necessary strength to hold the assembly in position. The thickness of the strip and the other dimensions of the same will, of course, be dependent upon the load which each clip must carry. This, in turn, depends upon the size and weight of the covering sheets and the number of clips employed for each sheet. The dimensions of the clip required for any particular roof or wall structure may be readily determined by one skilled in the art. As an example of a commercial form of the clip to be employed with the relatively heavy asbestos cement sheets, the clip may have, say, a thickness of ⅛ inch, a width of 1 inch, and an overall length of approximately 5 inches. It will be understood that this example is given for the purposes of illustration only.

At points spaced from the ends of the clip, perforations 11 and 12 are provided to receive securing bolts of a suitable diameter. Intermediate the perforations 11 and 12, and adjacent perforation 11, the strip is bent along a line 13 to provide an intermediate portion 15 extending at substantially a 45° angle to an end portion 16. The clip is also bent along a line 14 adjacent perforation 11 at an angle of approximately 45° to define an end portion 17, the end portions 16 and 17 lying in spaced parallel planes.

Referring to Figs. 2 and 3, a roof assembly is shown comprising a corrugated roofing sheet 20 which may be of metal, but preferably is of an asbestos cement composition. The roofing sheet is supported on a suitable purlin 21, having an extending flange 28. The roofing sheet is provided with spaced apertures 23 and 25, the aperture 23 being substantially in perpendicular alinement relative to the sheet with the edge of the flange 28 of purlin 21, and the aperture 25 being spaced from the aperture 24 a distance equal to

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the horizontal spacing of the openings 11 and 12 in the clip 10 of Fig. 1. A clip 10 is secured with one end thereof resting against the under surface of the flange 28, and its other end resting against the under surface of the roofing sheet with its apertures in line with the apertures 23 and 25 of the roofing sheet. The binding means comprising threaded bolts 22 and 24 provided with nuts 26 and 27, respectively, extend through the aligned apertures in the sheet and clip, the nuts 26 and 27 being threaded on the bolts to a sufficient extent to bind the ends of the clip firmly against the purlin flange and the roofing sheet.

As will be readily observed from an inspection of Fig. 2, the bolt 22 adjacent the edge of the purlin flange 28 securely binds together the flange and clip, and at the same time the adjacent relationship of the bolt and flange edge serves to prevent any appreciable downward sliding of the clip relatively to the purlin flange. The short bolt 24 securing the other end of the clip to the sheet binds the same together and prevents relative sliding therebetween. Thus, the roofing sheet 20 is rigidly secured to the purlin against both the tendency of the sheets to be raised by the action of winds or the like and to slip or slide by reason of their weight.

The bolts illustrated at 22 and 24 may be of any suitable type, but preferably include heads composed of, or having a covering layer of lead or other suitable, relatively soft, malleable material. As the bolt heads are drawn against the roofing sheet by the tightening of the nuts 26 and 27, the soft metal is pressed into the irregularities of the roofing sheet adjacent the apertures thereof to seal the apertures against the entry of moisture. Alternatively, conventional bolts may be employed and their heads sealed with putty, or the like, in the manner now customarily employed in the art.

In Fig. 4 there is disclosed a construction similar to Fig. 2. In this instance, however, the fastening construction is illustrated as applied at the overlap between adjacent roofing sheets. Here the fastening structure operates in a similar manner as in the construction shown in Figs. 2 and 3, but also serves an additional function in that it positively secures the overlapping sheets 20 together.

Referring to Fig. 5, a structural assembly for a side wall is disclosed. The assembly comprises corrugated sheets 20, preferably composed of asbestos cement mixtures, with their corrugations running vertically. The supporting means comprises a suitable horizontal base beam or angle member 31, additional angle members (not shown) being provided at spaced intervals of the vertical dimension of the wall. Clips 10 of the type disclosed in Fig. 1 are employed to secure the sheet to the flange 38 of the member 31, bolts 22 and 24 binding the clips to the flange and to the sheet 20 in a similar manner as explained in connection with the roofing assembly of Figs. 2 and 3. It will be understood that although the assembly is shown only adjacent to the lower end of the wall, similar securement is provided preferably at each horizontal supporting beam throughout the height of the wall to bind the sheets to the wall and overlapping sheets to each other.

It will be noted that, in contrast to conventional clips now in commercial usage for similar assemblies, the fastening clip as disclosed in Fig. 1 is reversible inasmuch as the apertures 11 and 12 are equally spaced from their respective ends of the clip and the bends 13 and 14 are similarly equally spaced from the clip ends. Hence, the clip may be incorporated in the assembly without the need of any great degree of skill or care, and delays or faulty construction due to improper placing of the clips cannot occur.

Having described my invention in rather full detail, it will be apparent that these details need not be strictly adhered to, but that various changes and modifications will occur to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What I claim is:

1. A structural assembly comprising a corrugated covering sheet, a support therefor including a flange and a securing clip, said clip comprising extended, planar similarly shaped and proportioned end portions lying in spaced substantially parallel planes and an intermediate portion at an angle to said end portions, the end portions of the clip underlying the flange and sheet, respectively, and being pressed thereagainst by means passing through the sheet and the end portions of the clip adjacent the intermediate portion of the clip.

2. A reversible fastening means for securing corrugated sheets to a support comprising a clip member having planar, extended, similarly shaped and proportioned end portions lying in spaced substantially parallel planes, and an intermediate portion lying in a plane at an angle to the planes of said end portions, and apertures in the end portions adjacent the intermediate portion.

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