

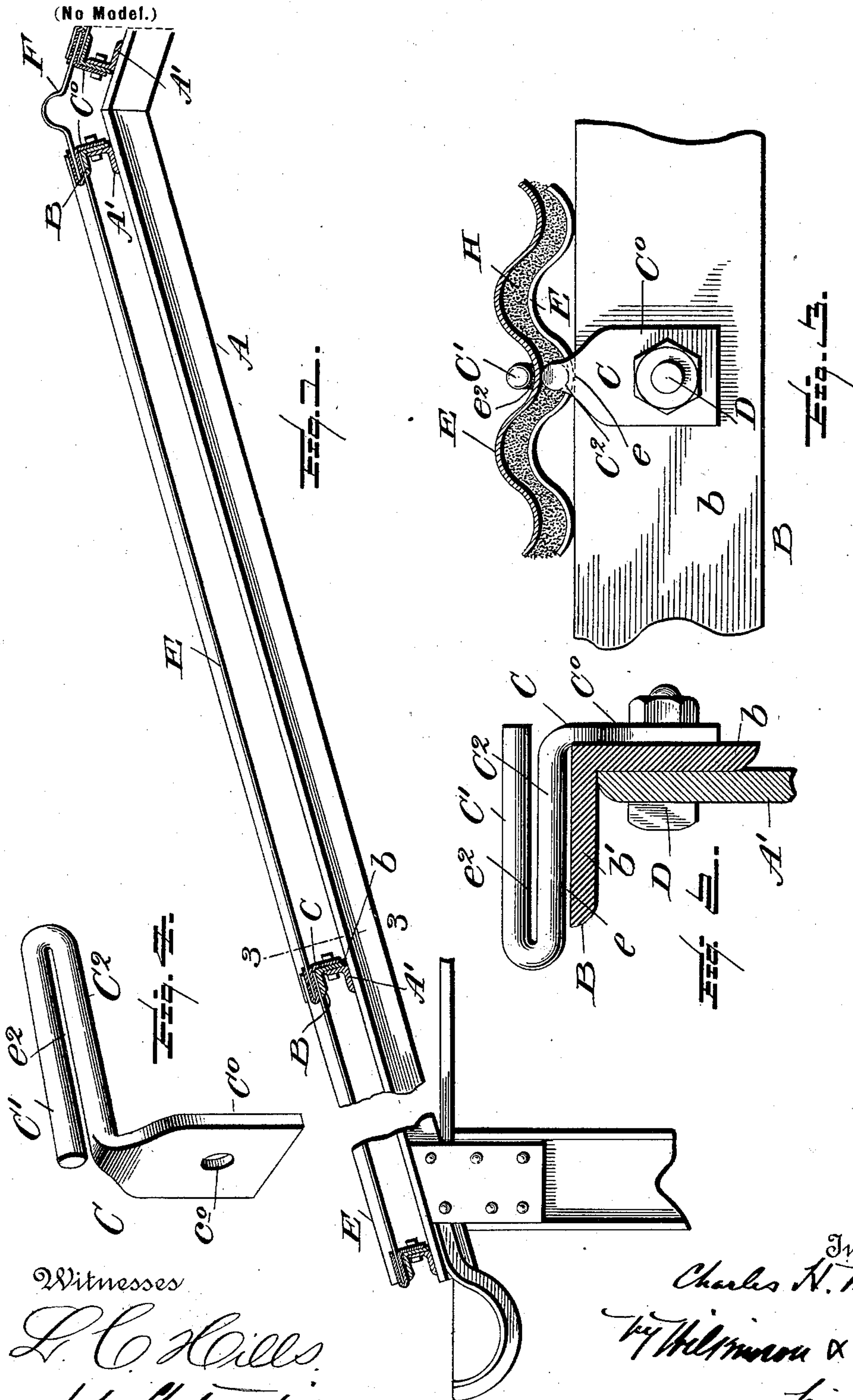
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C. H. WINDLE.

MEANS FOR ATTACHING METALLIC ROOFING SHEETS.

(Application filed Dec. 7, 1899.)



Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES HOWARD WINDLE, OF CALCUTTA, INDIA.

## MEANS FOR ATTACHING METALLIC ROOFING-SHEETS.

SPECIFICATION forming part of Letters Patent No. 673,229, dated April 30, 1901.

Application filed December 7, 1899. Serial No. 739,563. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES HOWARD WINDLE, a subject of the Queen of Great Britain, residing at Calcutta, India, have invented certain new and useful Improvements in Means for Attaching Metallic Roofing-Sheets; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in means for securing corrugated metallic roofing plates or sheets to the rafters of a building, the object being to provide a means which will avoid the necessity for making holes in the said sheets or plates and will, in addition, allow of the ready removal of any one or more of the plates or sheets from the roof for any purpose whatsoever without injury thereto or to the adjacent sheets or plates forming the roof.

My invention consists in the novel devices hereinafter described and claimed, and will be understood by reference to the accompanying drawings, wherein the same parts are indicated by the same letters throughout the several views.

Figure 1 is a fragmentary view of a portion of a roof structure provided with my invention, the view being partly in section and partly in elevation. Fig. 2 is an enlarged cross-sectional view of a purlin, showing one of my improved attaching-hooks secured thereto. Fig. 3 is a view, partly in elevation and partly in section, on the line 3 3 in Fig. 1, showing the relative positions of the adjacent edges of two metallic roofing-sheets and showing a packing between the same; and Fig. 4 is a perspective view of the hook made according to my invention for securing the edges of the roofing sheets or plates.

In Fig. 1, A represents one of the rafters across which are secured angle-irons or brackets A', provided with bolt-holes therethrough.

B represents the purlins, which are in the form of angle-irons and are secured along one element *b* thereof to the angle-irons or brackets A', as seen most clearly in Fig. 2. The other element *b'* of the purlins extends at right angles above the brackets or angle-irons A', to which the said purlins are secured, as above described.

The securing-hooks C are formed with flat shanks C<sup>0</sup>, perforated, as at *c*<sup>0</sup>, for the passage of bolts D, by means of which the shanks of the said hooks are secured flat against the outer side of the element *b* of the purlin, the said bolts passing through the purlin and its supporting-bracket, as well as through the hooks, thus securing the parts firmly together. The body of each hook is formed with two parallel elements C' and C<sup>2</sup> at right angles to the shank C<sup>0</sup>, and these elements are preferably cylindrical in form, as shown, to more readily grip the sheeting, by reason of the latter being formed with curved corrugations. The length of the shanks of the hooks C and the relative positions of the bolt-openings *c*<sup>0</sup> therethrough are so arranged that when the finished hooks are secured in position upon the element *b* of the purlin B a space sufficient for the reception of the edge of one of the roofing-sheets will be left between the under side of the lower element C<sup>2</sup> of the hook and the element *b'* of the purlin B, as seen most clearly at *e* in Fig. 2. The space at *e*<sup>2</sup> between the two elements C' and C<sup>2</sup> of the body of the hook C should also correspond with the thickness of the roofing-sheet which is to be inserted in this space *e*<sup>2</sup> between the two elements C' and C<sup>2</sup> of the hook.

In practice the lower edge of each sheet E engages a suitable number of attaching-hooks C in the space *e*<sup>2</sup>, between the elements C' and C<sup>2</sup> thereof, and the upper edge of the same roof-sheet engages in the spaces *e* between the lower element C<sup>2</sup> of the next upper row of hooks and the parallel element *b'* of the corresponding purlin B, or in the case of a sheet such as F, (shown in Fig. 1,) used at the angle of the roof the opposite edges of the said sheet would engage between the two elements C' and C<sup>2</sup> of the two rows of hooks attached to the purlins upon opposite sides of the said angle and next adjacent thereto.

The size of the hooks C and the spacing of the elements C' and C<sup>2</sup> from each other, as well as the spacing of the element C<sup>2</sup> from the parallel element *b'* of the purlin, will be arranged and controlled to suit the thickness of the roofing-sheets, the relations, however, being maintained practically the same in all cases irrespective of the thickness of the sheets. The number of hooks used for each



roofing-sheet E will depend upon the width of the sheet; but there should be at least two of such hooks at either of the opposite edges of the sheet.

5 To avoid all possibility of wind or water entering the space between the upper edge of one tier of sheeting and the lower edge of the next adjacent tier of sheeting where the two edges overlap, a strip of felt or other suitable  
10 material, as shown at H in Fig. 3, may be inserted between the two adjacent edges of the sheeting, or the spaces may be left open, if desired, for the purposes of ventilation.

Among the advantages arising from the use  
15 of the means hereinbefore described for securing the roofing-sheets to the purlins are principally the following: The initial cost of erecting a corrugated iron roof or shed is minimized in that no rivets or wind-ties are re-  
20 quired. There is a considerable saving of time and labor in erecting such a roof or shed. The roof or shed so erected may be taken down and reerected with ease and despatch and without the necessity for cutting or otherwise  
25 injuring the sheeting. The absence of holes in the sheeting ordinarily made for the passage of rivets or ties prevents leakage. Furthermore, defective sheets may be replaced and changed by merely unbolting the hooks  
30 securing the lower edge of such sheets, without displacing or removing any of the adjacent sheets, and many other advantages of my invention will be apparent to any practical mind.

35 Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a roofing structure, the combination

with the rafters; cross-beams secured to the rafters, and purlins in the form of angle-  
40 beams supported upon said cross-beams; of metallic hooks mounted upon said purlins and having perforated shanks; bolts passing through the shanks of said hooks and through the said purlins and cross-beams, and secur-  
45 ing these members to each other, substantially as described.

2. In a roofing structure, the combination with the rafters; cross-beams secured to the rafters, and purlins in the form of angle-  
50 beams supported upon said cross-beams; of metallic hooks mounted upon said purlins and having perforated shanks; bolts passing through the shanks of said hooks and through the said purlins and cross-beams, and secur-  
55 ing these members to each other, said hooks having parallel jaws also parallel with the upper face of the purlins, substantially as described.

3. In a roofing structure, the combination  
60 with the rafters; angle-beams arranged cross-wise of the rafters and secured thereto, and purlins in the form of angle-beams supported upon said angle-beams; of metallic hooks  
65 mounted upon said purlins and having perforated shanks; bolts passing through the shanks of said hooks and through the said purlins and angle-beams and securing these members to each other, substantially as de-  
70 scribed.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES HOWARD WINDLE.

Witnesses:

P. O. BENELEY,  
J. B. BAXTER.