Feb. 20, 1940. A. B. HASWELL 2,191,383

ROOFING SHEET

Filed May 27, 1935 3 Sheets-Sheet 1

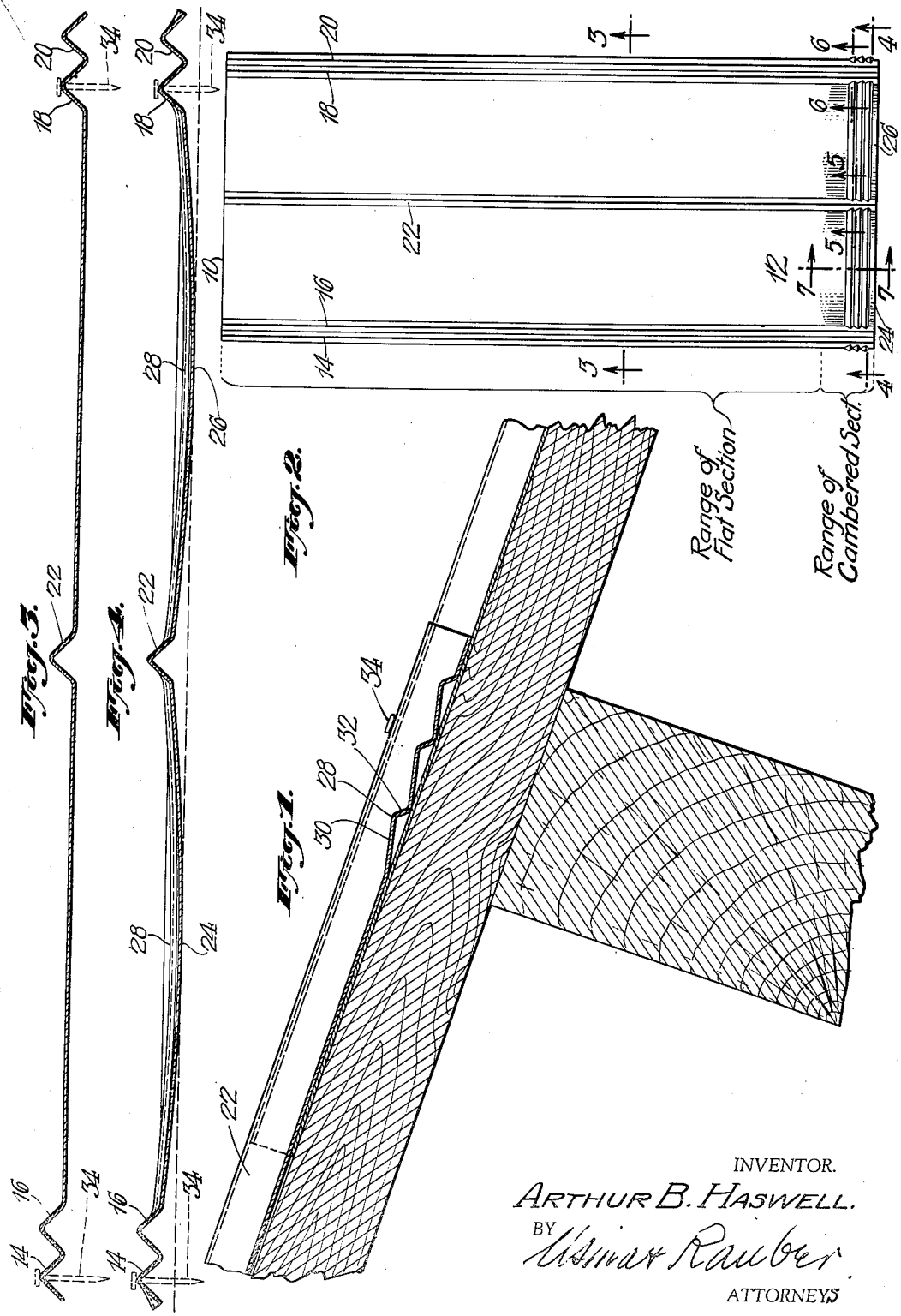


Fig. 3.

Fig. 4.

Fig. 2.

Fig. 1.

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ROOFING SHEET

Filed May 27, 1935 3 Sheets-Sheet 2

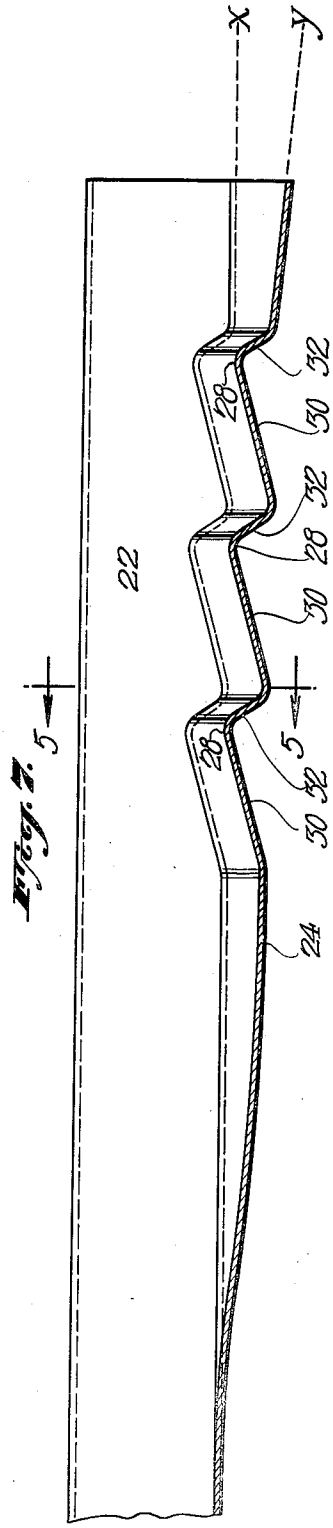


Fig. 7.

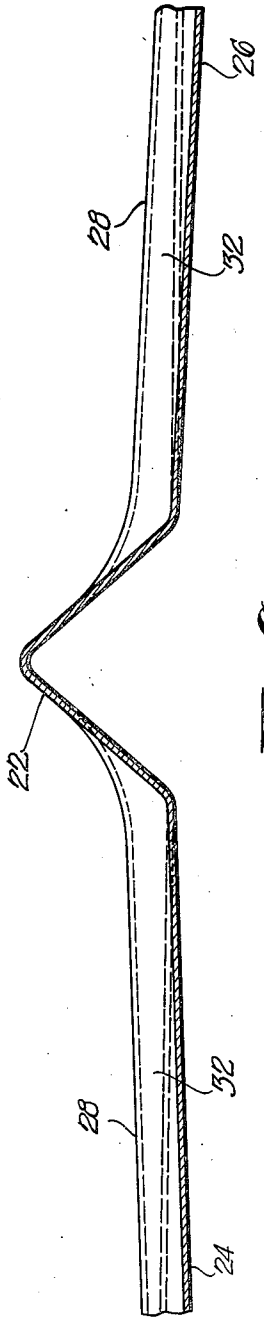


Fig. 5.

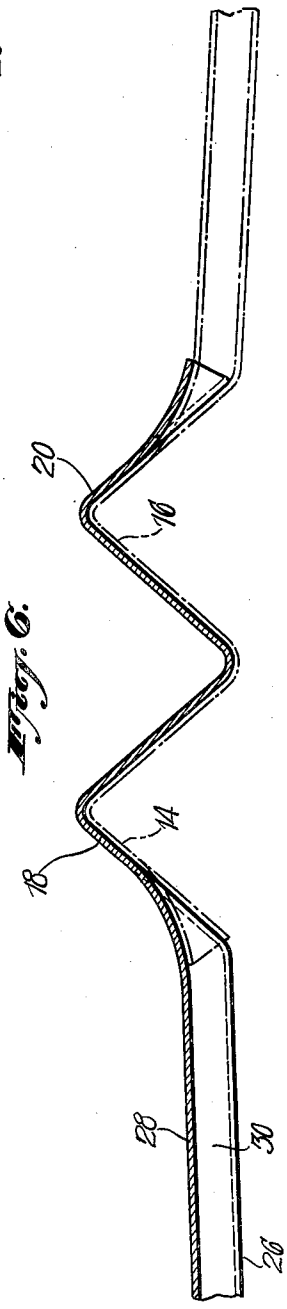


Fig. 6.

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Feb. 20, 1940. A. B. HASWELL 2,191,383

ROOFING SHEET

Filed May 27, 1935 3 Sheets-Sheet 3

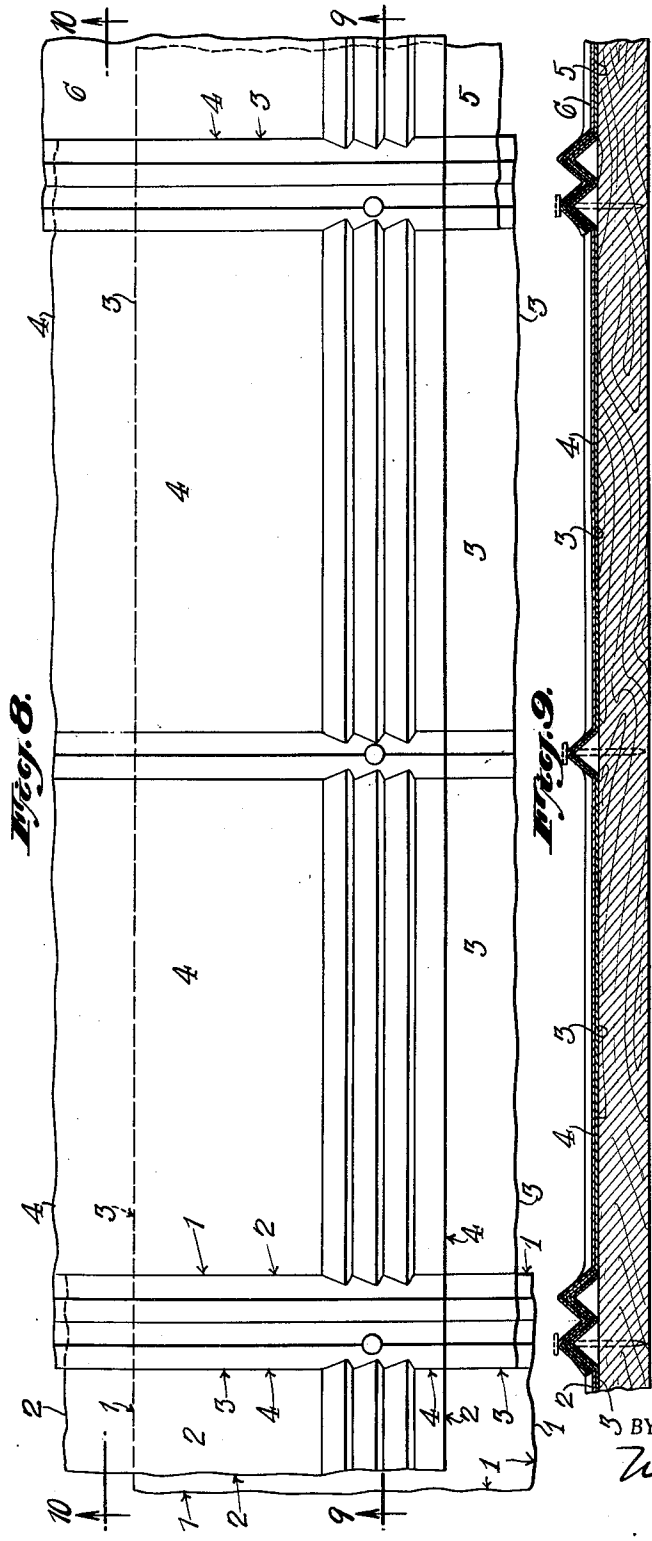


Fig. 8.

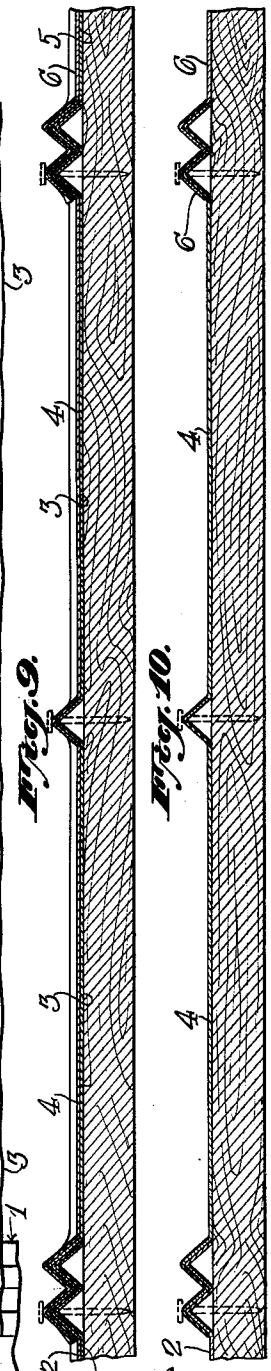


Fig. 9.

Fig. 10.

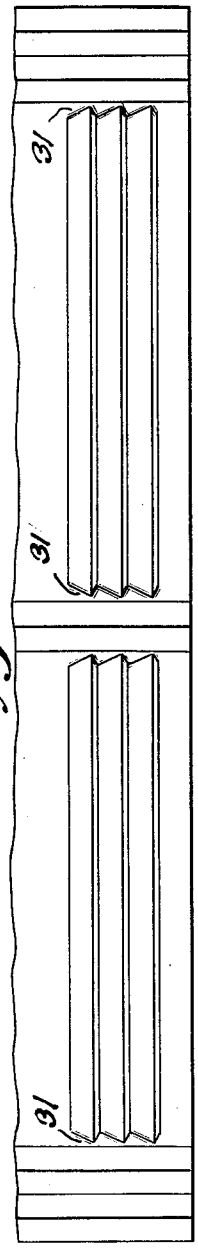


Fig. 11.

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Patented Feb. 20, 1940 2,191,383

UNITED STATES PATENT OFFICE

2,191,383

ROOFING SHEET

Arthur B. Haswell, Birmingham, Ala.

Application May 27, 1935, Serial No. 23,754

3 Claims. (Cl. 108—13)

One of the chief features of the invention resides in the provision of a sheet having a major portion of its area substantially flat, but with its lower end transversely cambered thus providing a concavo-convex portion arranged in such manner that the convex face of the camber is downward so that when the sheet is nailed down the cambered portion is bent or flexed transversely into a substantially flat plane and, therefore, the lower end of the sheet is put under slight tension which causes it to tightly hug the flat surface of an underlying sheet. The cambered portion of my improved sheet is preferably provided with one or more transverse ribs which insure maintaining the camber during shipment and also provide a desirable stiffness in the lower end of the sheet, which maintains the integrity of the structure in the assembled roof.

The above and further detailed features of the invention will be fully apparent from the following specification, drawings and claims.

In the drawings—

Fig. 1 is a vertical section through a portion of a roof illustrating the improved roofing sheet of the present invention; Fig. 2 is a plan view of one of the sheets embodying the invention; Fig. 3 is a typical cross section through the flat portion of the sheet, the section being taken, for example, at the plane indicated by 3—3 of Fig. 2; Fig. 4 is a cross section through the cambered portion of the sheet, the section being taken on line 4—4 of Fig. 2; Fig. 5 is an enlarged detail section on line 5—5 of Fig. 2; Fig. 6 is a similar enlarged detail section taken on line 6—6 of Fig. 2 and showing the overlapping of the ridge portions of two adjacent sections; Fig. 7 is an enlarged section on line 7—7 of Fig. 2; Fig. 8 is a plan view of a portion of a completed roof employing sheets of the present invention; Fig. 9 is a section on line 9—9 through the joint where the sheets overlap; Fig. 10 is a section on line 10—10 intermediate the points where upper and lower sheets overlap; Fig. 11 is a plan view illustrating a modification.

Referring in detail to the drawings, the roofing sheet of my invention has a major portion which is substantially flat. The range of the flat section extends from the upper edge of the sheet, indicated at 10 approximately to a line indicated at 12. Throughout the major area of the sheet, therefore, the same is substantially flat, its cross section having the appearance shown in Fig. 3. The flat surface is broken only at the sides and center by the usual form of raised ridges, which are substantially V-shape. In the sheet illustrated, there are a pair of parallel ridges 14 and 16, 18 and 20, at the sides of the sheet and an intermediate ridge 22 at the center of the sheet. In some cases, however, there may be a greater or lesser number of these ridges and, if desired, the central ridge may be entirely omitted. A particular feature of the invention resides in providing the sheet with lower portions which are cambered with the crowns of the cambered portions being lowermost. In the sheet illustrated, as best shown in Fig. 4, the cambered portions are indicated at 24 and 26 and provide concavo-convex faces, the convex faces being on the underside of the sheet, as clearly shown. These cambered portions occupy the limited zone at the lower end of the sheet beyond the line indicated at 12 in Fig. 2. And the lower end of the sheet, as best shown in Fig. 7 is inclined downwardly, the angle of inclination being indicated by the dotted lines x and y. The line x corresponds to the surface line of the roof on which the sheets are to be laid, which line of course is coincident with the underside of the flat portion of the sheet.

Extending transversely of the cambered portion of the sheet, I preferably provide cambered stiffening ribs, such as indicated at 28. These ribs are unsymmetrical. That is to say, each rib comprises a relatively wide portion 30 and a narrow shoulder portion 32, the shoulder portion of one rib merging into the wide portion 30 of the lower rib. These ribs are also cambered to follow the curvature of the lower cambered portion of the sheet. Preferably, they are relatively shallow, as compared with the depth of the ridges 14, 16, 18 and 22 and may merge thereinto, as shown for example in Figs. 5 and 6. Or, as shown in Fig. 11, the shallow transverse ribs may terminate short of the V-ridge as at 31.

The sheets are adapted to be laid up in such a way that the cambered lower end of one sheet overlaps the flat upper end of an underlying sheet.

Figs. 8 to 10 inclusive illustrate a portion of roof employing the sheets of the present invention and illustrate the manner in which the sheets are laid up. For convenience in these figures only, we have identified the separate sheets by numerals 1, 2, 3 and 4, illustrating a typical sequence of installing the roofing. In these figures, sheet 1 is first laid and then followed by sheets 2, 3 and 4. The lead lines and arrow heads in Fig. 8 show the respective edges of the four separate sheets. Reading this drawing in connection with the sequence in Figs. 9 and 10 makes

it clear, for example, that at the point where upper sheets overlap lower sheets, for example, as indicated by the section taken on line 9—9 (Fig. 8) there is two-ply metal between the outer V-ridges and four-ply metal at the edges.

At points intermediate the ends of the sheet, as indicated by Fig. 10, taken on line 10—10 of Fig. 8, it is clear that there is a single-ply of metal at the body portion of the sheet and two-ply metal at the edge joint where the ridges overlap. In applying roofing of this type, the nails are usually placed about twelve inches apart and are driven through the apex of the V-ridge next to the top edge of the sheet, as illustrated.

The invention is directed primarily, though not exclusively to the usual "tin" or other metallic sheets. Roofing sheets of this general character heretofore used have been open to the objection that the metal being thin has a tendency to buckle or warp. This is a common defect in sheets heretofore used. And although ribs have been resorted to in some cases this does not solve the problem. But the utilization of a cambered sheet, as above described, provides for deliberately employing a definitely shaped warpage which will be taken up when the sheet is nailed in contact with the flat portion of an underlying sheet.

By providing the crowned or cambered sheet with the transversely extending reinforcing rib, the integrity of the crowning is maintained during shipment. And by slightly inclining the lowermost extremity of the crowned part of the sheet, it will be appreciated that when the same is nailed down a close fit will be made with the underlying sheet. This will prevent any substantial quantity of water being driven upwardly. It will also prevent the tendency of loosening the sheets by wind pressure. The transverse ribs 28 will also provide grooves or air spaces. And, as is well known in the art, such ribbing has a tendency to prevent objectionable capillary action.

Various modifications may be made by those skilled in the art without departing from the invention as defined in the appended claims.

What I claim is:

1. A metallic roofing sheet, the major area of which is flat and whose lower end is transversely cambered to provide concavo-convex faces, the convex face being on the underside of the sheet, said cambered portion being adapted to overlap the flat portion of a similar sheet and to be flexed transversely to make a snug fit therewith.

2. A metallic roofing sheet having respective parallel ridges extending lengthwise along each edge and along the intermediate portion of the sheet, the major area of the sheet being flat, and respective end portions thereof on opposite sides of the intermediate ridge being transversely cambered to provide respective concavo-convex faces, said convex faces being on the underside of the sheet, said cambered portions being adapted to be flexed transversely to make a snug fit with the flat portion of a similar sheet.

3. The roofing sheet of claim 1 further characterized by the provision of transverse ribs in the cambered portion adapted to insure maintaining the camber during handling and shipment of the sheets.

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