CORRUGATED TRANSLUCENT SHEETS AND MEANS SECURING THE SAME

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This invention concerns roofing of the kind involving the use of rectangular sheet elements formed with longitudinal corrugations; such elements may be transparent, translucent or opaque, according to the purpose for which the roof is intended and the sheet material used, for example, galvanized iron, aluminum, asbestos cement or plastic.

According to normal procedures, when sheeting a roof with corrugated sheet elements, the longitudinal edges of adjacent sheets are overlapped, usually to the extent of two complete corrugations, with the object of providing a weather seal against the entry of rain between the longitudinal edges of the sheets. However, such constructions do not prevent dirt and moisture from collecting between the overlapping parts, which are liable to rust if the sheets are of iron. Moreover, when sheets of transparent or translucent plastic material are used in the roof covering for the purpose of admitting light, the layer of dirt which accumulates between the portions of the sheets which overlap eventually results in the formation of dark bands which substantially reduce the effective area of the roof through which light can pass and the efficiency of the roof for the transmission of light is appreciably impaired.

The object of the invention is to provide improved roofing elements and a manner of applying same to a roof which will enable the above mentioned disadvantages to be substantially overcome, while ensuring that a weather-tight roof is obtained without difficulty.

According to the invention, the longitudinal marginal portion of a corrugated sheet of roofing material constituting a roofing element is bent up substantially at right angles to the general plane of the sheet and either terminates in an inverted U-shaped hook-like extremity, or it may be provided with a separate strip of U-shaped cross-section adapted to fit thereover, the width of the space between the two limbs of the U-shaped strip being approximately equal to twice the thickness of the sheet material. Corrugated joint-covering elements may also be provided, of which a portion is formed with one or more regular corrugations conforming to the corrugated form of the roofing elements, while an adjacent portion follows the contour of the marginal portions of two contiguous roofing elements, including the U-shaped hook-like extremities thereof or the U-shaped strip applied thereto as the case may be. The joint-covering elements are shaped as above stated for the purpose of providing a weather seal at the places where two roofing elements disposed with their longitudinal edges together are overlapped along their upper edges by other corrugated roofing elements. Where such overlapping by corrugated elements occurs, it is necessary to cut away the adjacent marginal portions of the improved roofing elements where the latter pass under the corrugated roofing element which overlaps their upper edges, but the joint-covering elements inserted between the roofing elements so as to cover said cutaway portions and to extend partially over the adjacent marginal portions which are not cut away, serve to provide a weather-proof seal.

In order that the invention may be clearly understood and readily carried into practice it is hereinafter described with reference to the accompanying drawings, wherein:

FIG. 1 is an end elevation of two overlapping portions of corrugated roofing elements of normal construction, FIGS. 2 to 5 are similar end elevations of the adjacent portions of corrugated roofing elements according to the invention, showing a number of alternative constructions,

FIGS. 6 and 7 are an end elevation and side elevation of joint-covering element according to the invention, and FIG. 8 is a perspective view of a portion of a roof where two adjacent roofing elements according to the invention are overlapped by a third corrugated roofing element and a joint-covering element is employed to ensure a weather seal.

Corresponding parts are indicated by similar reference numerals in all the views.

Referring to the drawings, FIG. 1 shows the manner in which the marginal portions of two contiguous corrugated roofing elements 1, 2 of normal construction overlap. They may overlap to the extent of one complete corrugation or two corrugations, according to the requirements, but usually the corrugations do not seat together precisely so that moisture and dirt may enter and accumulate between the overlapping portions of the elements, and in some cases the joint is not particularly air-tight. If the roofing elements are of metal they will deteriorate, which if the elements are of transparent plastic material for the purpose of admitting light, the joint soon becomes a broad dark band which obscures the light and spoils the appearance of the roof.

These disadvantages are substantially eliminated by the present invention, and FIG. 2 shows one construction in which the marginal portion 3 of the corrugated roofing element 1 is bent at right angles to the general plane of the corrugated sheet and its extremity 4 is turned over to provide a inverted U-shaped margin to the sheet 1. The opposite marginal portion 5 of the sheet 2 is also bent at right angles to the plane of the sheet and fits, preferably tightly, within the U-shaped margin of the sheet 1. A small space 6 preferably exists adjacent the bend of the U-portion and this serves to stop any seepage of moisture by capillary action between the parts 3 and 5. The fact that the lower edge of the extremity 4 terminates substantially above the corrugated surface of the member 2 also assists in maintaining a dry joint between the parts 3, 4 and 5 because moisture cannot readily lie on the corrugated sheet. It will be observed that the pitch of the corrugations of the assembled sheets 1 and 2 is maintained uniform throughout.

An alternative construction according to the invention is shown in FIG. 3, wherein the marginal portions 3 and 5 of the adjacent corrugated elements 1 and 2 both bent at right angles to the plane of the elements, are placed together in abutment and held between the limbs of a U-shaped cover strip 7. If desired the latter may be held in position by bolts 8 passing through the assembled parts 3, 5 and 7, bitumastic washers 9 preferably being provided beneath the bolt head and the nut 10 to prevent...
any possibility of moisture entering through the bolt holes.

FIGS. 4 and 5 show further alternative constructions. FIG. 4 is similar to FIG. 3, except that the marginal portions 3 and 5 are bent up from a hollow instead of a crest of the corrugated elements to which they respectively belong, the pitch of the corrugations of the assembled elements not being changed. FIG. 4 also shows that a plastic or putty-like stopping 11 may be provided, filling the space between the bend of the U-shaped strip 7 and the extremities of the marginal portions 3, 5.

In FIG. 5 the marginal portions 3 and 5 of both adjacent elements 1, 2, while it enhances the rigidity of the elements, presents a problem in ensuring a weather seal at points where the elements are overlapped by further corrugated roofing located above them for example, on a sloping roof. This problem is solved according to the invention by the provision of joint-covering elements which may advantageously be formed as shown in FIGS. 6 and 7. The element 13 consists of a strip of roofing material curved to the form of a corrugation and having a raised hood-like portion 14 which conforms to the shape of the hook-shaped marginal portion 3 over which it is adapted to be fitted. The assembled construction is shown in FIG. 8, wherein the roofing elements 1 and 2 shaped and assembled as described above with reference to FIG. 2, are overlapped by a third corrugated roofing element 15. At the point where the element 15 intersects the marginal portions 3, 5 of the elements 1 and 2, the portions 3 and 5 are cut away (as indicated by dotted lines 16 in FIG. 8), and the joint-covering element 13 is inserted partially between the elements 1, 2 and 15 with its hood-like portion 14 covering the end of the raised marginal portion 3 of the element 1, the flanks of the element 13 closely seated upon the underlying curved surfaces of the elements 1 and 2. The preferred amount which the element 15 overlaps the elements 1 and 2 may depend upon the angle of slope of the roof in question, a smaller overlap being permissible with a more steeply sloped roof. The arrangement ensures, however, that the point where the element 15 overlaps the meeting edges of the elements 1 and 2 is protected against the entry of moisture.

The invention ensures that a roof of corrugated sheet material may be readily constructed without the danger or disadvantage of dirt and moisture entering and collecting between the adjacent roofing elements, heat losses are also prevented as the joints between the elements are substantially air-tight, and there is also a substantial saving in roofing material as loss of effective area by overlapping of the marginal corrugations of adjacent elements, which occurs with the normal construction shown in FIG. 1 of the accompanying drawings is also substantially eliminated.

I claim:

1. In a roof, an assembly of roofing elements comprising rectangular corrugated sheets of translucent material disposed contiguously side by side in a common plane, the marginal portions of the sheets being perpendicular to the general plane of the sheets, and means of U-shaped cross-section for securing together the contiguous marginal portions of adjacent sheets with the interface between the marginal portions perpendicular to the general plane of the sheets.

2. In a roof, an assembly of roofing elements comprising in combination two rectangular corrugated sheets disposed side-by-side in a common plane with their adjacent longitudinal marginal portions bent perpendicularly to the general plane of the sheets and placed together in surface contact, at least one of said marginal portions being of U-shaped cross-section and having hooked engagement with the adjacent marginal portion of the other sheet, the remainder of the two sheets presenting together a uniformly corrugated surface, a third corrugated sheet partially overlapping one transverse marginal portion of each of the other two sheets, the aforesaid longitudinal marginal portions of which are cut away where said third sheet overlaps said other two sheets, and a joint-covering element having a base portion shaped to conform to the corrugated form of the sheets and overlapping said cutaway portions and underlying said third sheet where said third sheet overlaps the junction of the other two sheets, and also having a hood-shaped portion extending over the adjacent parts of the contiguous longitudinal marginal portions which are in hooked engagement as aforesaid, said hood-shaped portion being closed at its end adjacent said base portion.

3. In a roof, an assembly of roofing elements comprising in combination two rectangular sheets disposed side by side in a common plane with their adjacent longitudinal marginal portions bent perpendicular to the plane of the sheets and disposed together in surface contact, means of U-shaped cross section for securing together the contiguous marginal portions of the sheets, a third sheet partially overlapping one transverse marginal portion of each of the other two sheets, said longitudinal marginal portions being cut away where said third sheet overlaps said other two sheets, and a joint-covering element having a base portion overlapping said cutaway portions and underlying said third sheet where said third sheet overlaps the junction of said other two sheets and having a hood-shaped portion extending over said means of U-shaped cross section, said base portion extending laterally outwardly from said hood-shaped portion and conforming to the form of said other two sheets, said hood-shaped portion being closed at its end adjacent said base portion.

4. An assembly as claimed in claim 3, said sheets being corrugated.

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