Nov. 13, 1962 J. V. RYLANDER 3,063,201

ROOF CONSTRUCTION

Filed July 28, 1958

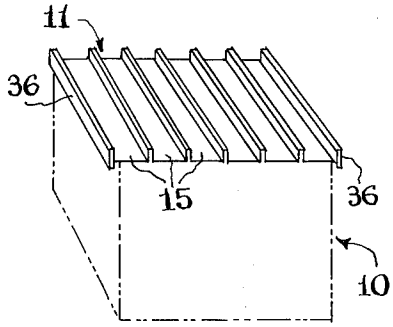


FIG. 1

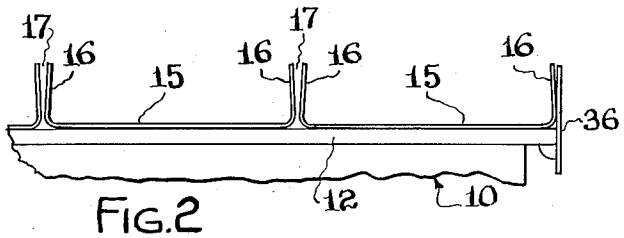


FIG. 2

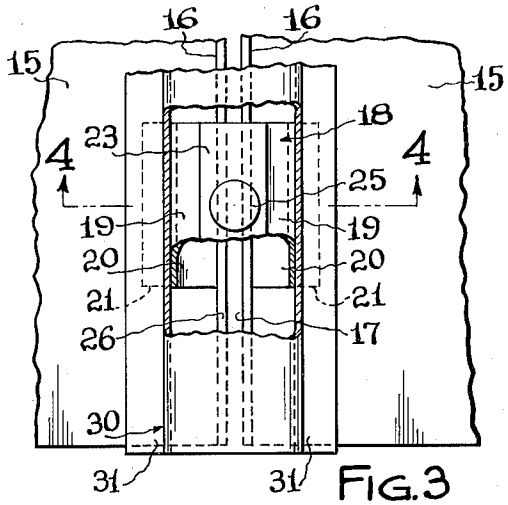


FIG. 3

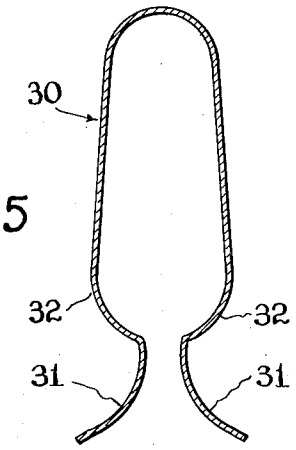


FIG. 5

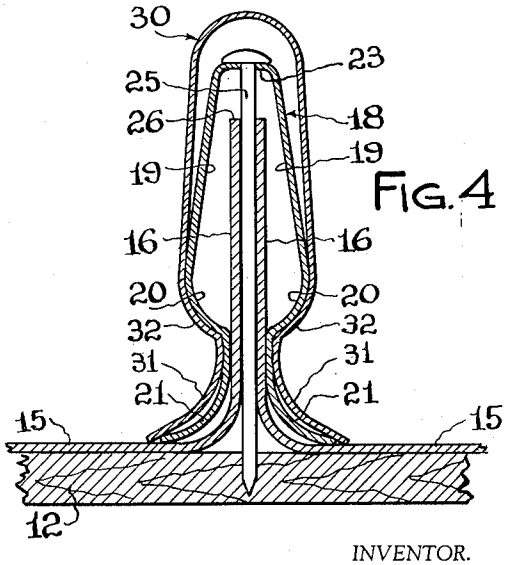


FIG. 4

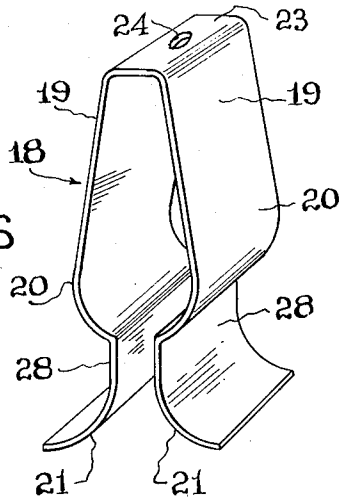


FIG. 6

INVENTOR.

JOHN V. RYLANDER

BY

ATTORNEY.

United States Patent Office 3,063,201 Patented Nov. 13, 1962

3,063,201

ROOF CONSTRUCTION

John V. Rylander, 3265 Rida St., Pasadena, Calif.

Filed July 28, 1958, Ser. No. 751,379
5 Claims. (Cl. 50—210)

This invention relates to roof constructions and more particularly to an improved weather-proof metal covering particularly suitable for use on substantially flat horizontally disposed roofs and characterized by the absence of holes of any kind for the passage of fasteners, and in other respects to be pointed out below.

There have been many prior proposals for roof coverings formed by interfitting sheet metal components so formed as to avoid leakage. However, these proposals have been subject to certain shortcomings and disadvantages obviated by the present roof covering. For example, it has been proposed to utilize sheet metal elements of various conformations adapted to be assembled in overlapping relation similarly to wooden shingles to form a roof covering. Openings for nails or other type fastening elements are provided in overlapping portions of these members in their assembled positions. However, it is found that strong winds are effective in turning up the free edges of these members causing them to be bent and otherwise deformed if not actually carried away with the wind. To avoid these disastrous results, resort has been had to various expedients in an attempt to circumvent these consequences including different interlocking constructions in efforts to anchor the free edges in place. These are successful only to a limited extent.

Another serious disadvantage of prior roof constructions is the opportunity provided for leakage by capillary action between the closely spaced surfaces of the overlapped portions or by reason of strong winds forcing water upwardly between overlapped elements. Such leakage is greatly promoted in colder climates due to freezing of the trapped layer and the subsequent thawing from the innermost edge by heat emanating from the interior of the building. The lower edge remaining frozen, such moisture can only escape by flowing upwardly into the interior of the building.

Another defect of prior roof constructions of the general type here disclosed has been the use of anchor clips which are forced against the upper edges of the upturned flanges of the principal covering component. This mode of anchoring often results in partial crushing of these flanges. Furthermore, expansion and contraction of the covering members is effective to loosen the anchor clips. Even moderate winds are then effective in carrying away the roof covering.

The foregoing and other serious shortcomings of prior roof coverings are entirely avoided by the present invention.

Another particularly serious shortcoming of prior constructions using overlapped components is the unsuitability of such designs for use on flat or substantially flat, horizontally disposed roofs. This follows from the dependence in prior designs for overlapping joints to avoid leakage. Such inclined roofs are much more costly both for materials and more particularly for the labor required in their fabrication and erection.

The roof covering provided by the present invention avoids the foregoing and other serious shortcomings in prior roof constructions and provides a simple, inexpensive, easily-applied roof covering free of the need for overlapping surfaces as respects the principal components of the covering. The covering is particularly characterized in being especially suitable, though not limited to, application to flat, horizontally disposed roofs. The principal components comprise trough-shaped sheet metal

elements free of transverse joints and extending from edge-to-edge of the roof. These components are laid side-by-side in closely spaced relation with their side flanges upturned. These members are adapted to be anchored in place without need for openings of any kind in the main component, use being made preferably of resilient fastener clips embracing the upturned exterior sides or edges of adjacent troughs and secured to the roof by nails, screws or the like fasteners extending into the roof proper in the vertical space between the upturned flanges. Combined sealing and closure strips extending the full length of the trough-shaped members are pressed downwardly over the fastener clips and are interenageable therewith in a manner detachably locking the closure strips in assembled position.

Accordingly, a principal object of the present invention is the provision of an improved roof covering requiring no fastening devices passing through the covering proper.

Another object of the invention is the provision of an improved metallic roof covering, the principal components of which extend from edge-to-edge of the roof and are adapted to be held in place by resilient fastener means designed to maintain the main covering in firm contact with the underlying supporting structure without interference with the contraction and expansion of the main covering.

Another object of the invention is the provision of an improved roof covering formed from trough-shaped metal members applied to a substantially horizontal roof surface with their opposite ends substantially contiguous to the opposite lateral edges of the roof.

Another object of the invention is the provision of an improved weather-proof roof covering formed from trough-shaped sheet metal members having upturned edges resiliently held in place against the supporting roof by spring clip fasteners straddling the upturned edges of the members.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which a preferred embodiment of the invention is illustrated:

FIGURE 1 is a perspective view of a completed roof constructed according to this invention;

FIGURE 2 is a fragmentary elevational view on an enlarged scale showing an end corner of the roof before the fastening and closure means are applied;

FIGURE 3 is a fragmentary top plan view on an enlarged scale with parts broken away showing details of the fastener and closure means;

FIGURE 4 is a vertical sectional view taken on line 4—4 of FIGURE 3;

FIGURE 5 is a cross-sectional view through the closure strip; and

FIGURE 6 is a perspective view of one of the resilient spring clips used in holding the trough-shaped members secured to the roof.

Referring more particularly to FIGURES 1 and 2, there is shown a building 10 having a flat substantially horizontally disposed roof overlaid with a weather-proof covering 11 exhibiting the features of this invention. It will be understood that roof support 12 may be constructed in any suitable manner well known in the art.

Covering 11 comprises elongated trough-shaped sheet metal members 15 having upturned lateral edges 16. It is important that the length of members 15 be as great as the width of roof support 12 to be weather-proofed to avoid the need for transverse joints between members 15.

Assembly of the roof covering is accomplished simply by placing the trough-shaped members 15 in side-by-side

relation on roof support 12, care being taken to have the ends projecting to and preferably slightly beyond the opposite sides of the roof proper. Desirably, the upturned flanges 16, 16 of adjacent members 15 are spaced slightly from one another, as is indicated at 17, to provide for the insertion of a suitable fastener such as a nail, screw, bolt or other fastener element.

Following laying of the channel members, resilient anchor clips, designated generally 18 and best shown in FIGURE 6, are pressed downwardly over a pair of adjacent flanges 16, 16. It is pointed out that clips 18 have a generally U-shaped configuration with the legs 19 bowed away from one another as indicated at 20 and with the lower ends 21 flaring outwardly along an arcuate contour. Clips 18 are preferably formed of relatively stiff resilient material and in such manner that ends 21 press firmly and under considerable pressure against the underlying portions of members 15 in the manner best shown in FIGURE 4 and for a purpose which will be explained more fully presently.

To hold the anchor clips 18 securely to roof 12, bight portion 23 of each is provided with an opening 24 for a fastener element, such as a screw or a nail 25. Of importance is the fact that bight portion 23 is preferably spaced appreciably above upper edges 26 of flanges 16 in the fully assembled position of the clips. Maximum advantage can then be taken of the resilient characteristics of the clips in holding members 15 firmly anchored to the roof at points opposite the flaring and resilient ends 21 rather than by pressure applied vertically to edges 26 as has been the practice heretofore. To this end, nails 25 are driven into supporting structure 12 sufficiently to compress legs 19 of the clips and cause portions 20 to bulge outwardly away from one another. Even when fully assembled, it is pointed out that bight portion 23 of the clips is spaced appreciably above flange edges 26.

Owing to the above described features, it will be apparent that the legs 19 of the clips are placed under resilient compression forcing the flaring ends 21 of the clips firmly against the bottoms of trough-shaped members 15. Since no pressure is applied to the upper edges of flanges 16 there is no force transmitted through these flanges and into the main body of members 15 tending to bulge their midportions upwardly away from the roof. Furthermore, members 15 may expand and contract laterally without loosening the anchoring nails 25. Nor is there any tendency upon expansion of members 15 to lift the fastening nails out of roof support 12. Accordingly, the described metallic covering is held snugly assembled to the roof under all temperature conditions and irrespective of forces attending expansion and contraction thereof.

It is pointed out that anchor clips 18 are appropriately spaced lengthwise of flanges 16 and that, in their assembled position, portions 28 of ends 21 are held resiliently pressed against the outer or exterior faces of flanges 16 in a manner to hold these pressed toward fastener nails 25.

Weather-proofing of the described structure is assured by the assembly over each pair of flanges 16 of a closure strip designated generally 30 having the configuration best illustrated in FIGURE 5. Closure strip 30 is likewise preferably formed of resilient sheet metal and has a length coextensive with the length of members 15. Its lower free edges 31 flare outwardly in a manner conforming generally to the shape of ends 21 of clip 18 but, desirably, are sufficiently longer to overlie and enclose the ends of clip 18. The opposite sides of the closure strip are provided with complementarily bowed portions 32, 32 shaped to nest over and interlock with the similarly shaped portions 20, 20 of clips 18. Assembly of strips 30 is accomplished by depressing the flared ends 31 over the tops of clips 18 until the bowed portions 32 snap snugly beneath the lower extremity of bowed portions 20 of the anchor clips. These interlocking portions will be understood as rigidly and securely locking the closure strips in place with the lower edges 31 seated resiliently against members 15 and cooperating with flaring ends 21 of the anchor clips in holding the roof covering in assembled position.

The opposite end edges of roof 11 may be sealed by means of either a wooden or a metallic closure finishing strip 36 secured to the edge of roof 12 in any suitable manner and having its upper edge lying in closely spaced relation to flange 16 of the adjacent trough member 15. The upper edge of strip 36 will then be understood as forming a substitute for the missing upturned flange 16 of another trough member. Anchor clips 18 and a closure strip 30 are then assembled over the adjacent flange 16 and the upper edge of strip 36 in the same manner described above in connection with a pair of trough members. It will be recognized that the opposite ends of the closure strips may be and preferably are sealed with a suitable sealing compound or other means to prevent the possibility of moisture, wind, insects and the like entering at these points.

While the particular metal roof covering herein shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or design other than as defined in the appended claims.

I claim:

1. A fastener clip and closure strip assembly securing channel shaped roof covering members to a flat roof supporting structure free of battens in a weatherproof manner, said assembly comprising a plurality of similar spaced apart U-shaped metal clips formed of narrow resilient strip material the legs of which have a length in excess of the height of the upturned edges of adjacent channel shaped roof covering members which they straddle, the up-turned edges of said roof covering members being free of openings and cut-outs, the ends of said legs flaring away from one another and being held resiliently pressed downwardly and directly against the horizontally disposed bottom surfaces of said roof covering members in metal to metal contact by fastener means passing through the bight portion of each clip and into said roof supporting structure at a point between the adjacent upturned edges of a pair of said channel shaped roof covering members, said clip legs have detent means thereon, and a one-piece elongated imperforate closure strip of U-shape having flaring edges snapped into assembled position over a plurality of said clips aligned laterally of one another along the upturned edges of a pair of roof covering members and being effective to conceal a plurality of said clips, said closure strip having detent means engaged with said detent means of said clip legs and cooperable therewith to hold the flaring edges of the closure strip pressed snugly against the bottoms of the associated roof covering member.

2. The assembly defined in claim 1 characterized in that said fastening clips have portions thereof resiliently pressed against the exterior surfaces of the upturned edges of said channel-shaped members and cooperate therewith in stabilizing said edges against lateral deflection.

3. A battenless weatherproof roof covering comprising trough-shaped sheet metal members free of notches and openings along the upturned lateral edges thereof and arranged side-by-side in closely spaced-apart relation on a flat roof supporting structure free of batten strips and of attached hold-down means for said sheet metal members, a plurality of inverted U-shaped clips formed of narrow strips of resilient material of uniform width and free of appendages, each leg of said clips being appreciably longer than the height of the upturned lateral edges of said sheet metal members and having inwardly indented portions in each leg and outwardly flaring end portions pressed resiliently against the bottoms of said sheet metal

members to hold the latter resiliently pressed against the underlying roof supporting structure, fastener means passing through the bight portion of said clips and into said roof supporting structure at a point between the adjacent upturned edges of a pair of sheet metal members to hold the resilient lower ends of said clips pressed against the juxtaposed bottoms of said sheet metal members with the bight portion of said clips appreciably above and out of contact with the upturned edges of said sheet metal members and with the indented portions thereof engaging the upturned exterior sides of said trough-shaped members, and a one-piece elongated inverted U-shaped closure member of sheet metal embracing a plurality of said clips and the intervening lengths of said upturned edges, said closure member having indented portions along its opposite sides seated in generally complementally shaped indented portions in the legs of said U-shaped clips and interact therewith to hold said closure member in assembled position.

4. A weatherproof covering as defined in claim 3 characterized in that said sheet metal members have a length extending the full width of said roof supporting structure between the opposite lateral edges thereof.

5. A weatherproof covering as defined in claim 3 characterized in that the lower lateral edges of said closure member flare outwardly away from one another and engage the upper surfaces of the bottoms of said trough-shaped sheet metal members along lines of contact spaced outwardly beyond the contact of said clip ends therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

356,393	Helliwell	Jan. 18, 1887
496,685	Harris	May 2, 1893
818,624	Haslam	Apr. 24, 1906
1,169,240	Coleman	Jan. 25, 1916
2,356,833	Doe	Aug. 29, 1944
2,358,733	Overly	Sept. 19, 1944
2,428,361	Doe	Oct. 7, 1947
2,538,328	Roos	Jan. 16, 1951

FOREIGN PATENTS

17,749	Great Britain	1896
807,500	France	1936
168,032	Australia	1956