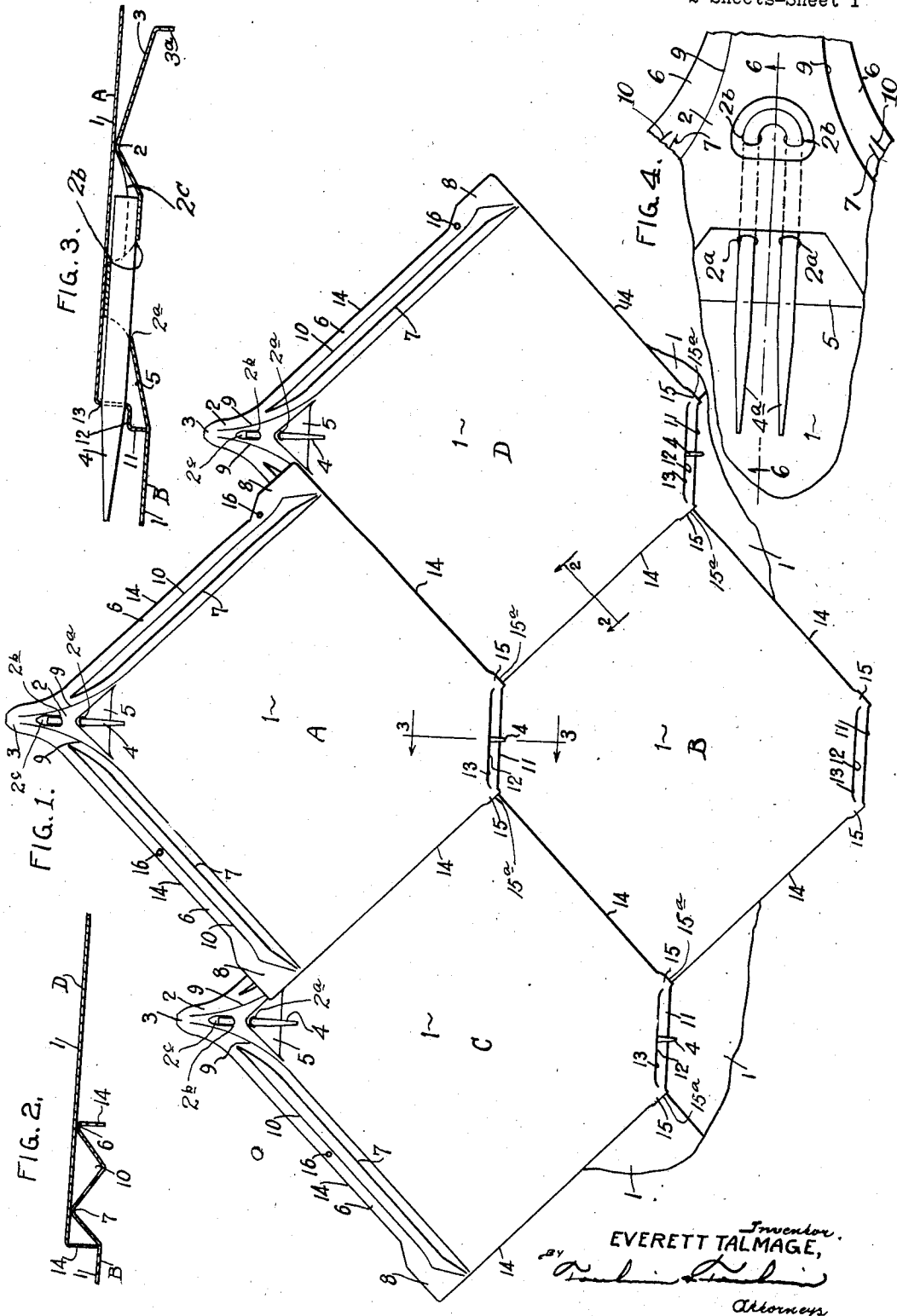


Oct. 18, 1938.

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ROOFING STRUCTURE
Filed July 10, 1936

2,133,363

2 Sheets-Sheet 1



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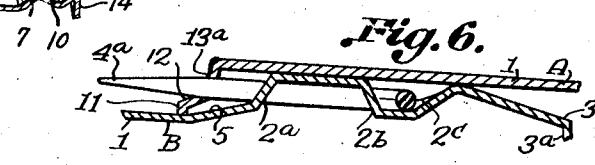
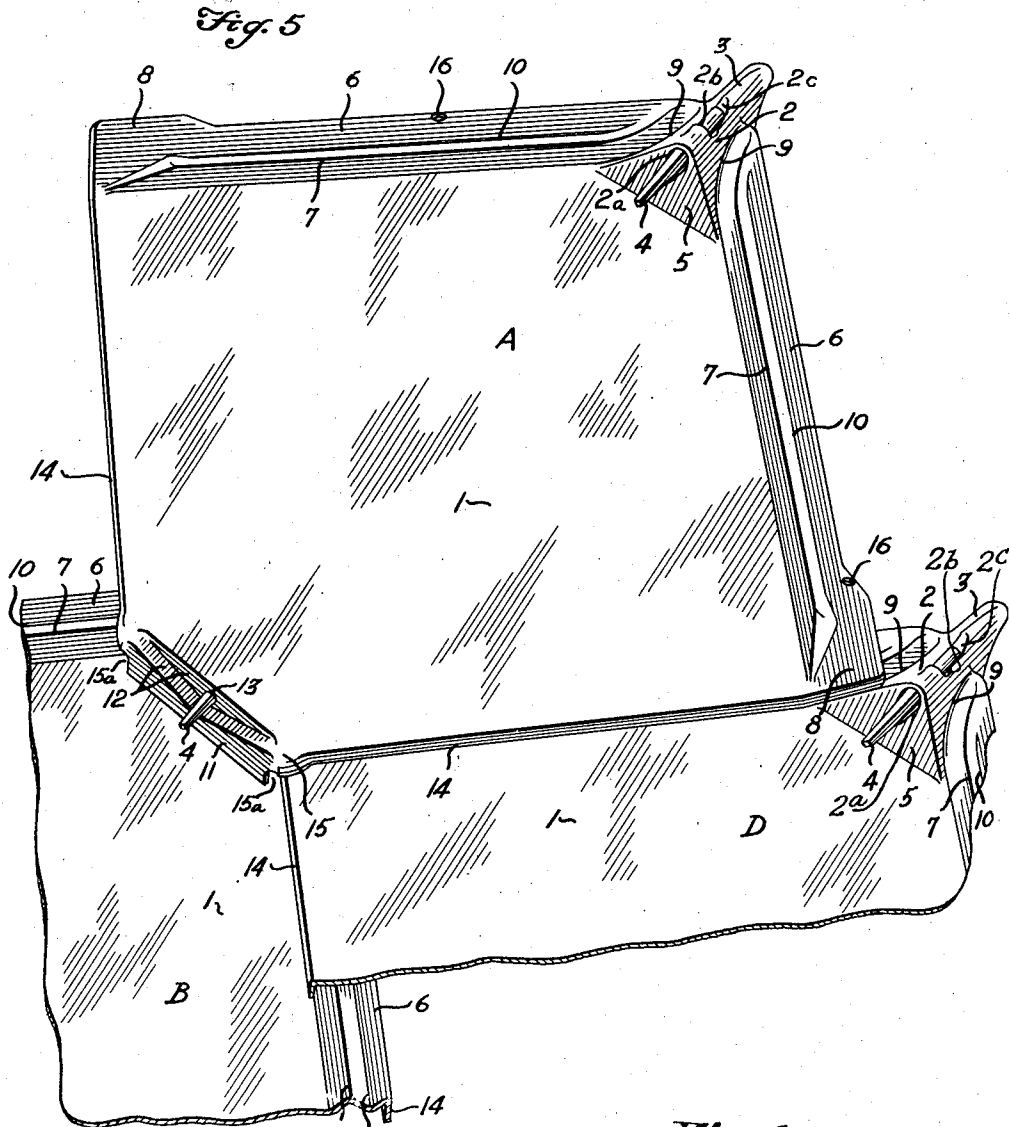
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2 Sheets-Sheet 2



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2,133,363

ROOFING STRUCTURE

Everett Talmage, Sabina, Ohio

Application July 10, 1936, Serial No. 89,948

15 Claims. (Cl. 108—17)

This invention relates to roofs and in particular to metal roofs.

It is an object of this invention to provide a roof which may be applied in sections and which will be self-draining, both at the surface and at the joints.

It is a further object of this invention to provide such a roof, in which the connection of the sections will be sufficiently tight to prevent the entrance of moisture, snow and dirt and which may be quickly and simply applied and easily removed as to have a high salvage value.

It is a further object of this invention to provide such a sectional roof which will have the maximum firmness of attachment, both of the sections to one another and of the roof to its support with the minimum of nails.

It is a further object of this invention to provide such a roof which will produce dead air spaces between the respective sections or plates and the roof support.

It is a further object of this invention to provide a roof joint which will prevent the leakage of water by capillary attraction by the interposition of a plurality of air spaces in the path of the water.

It is a further object of this invention to provide such a roof in which the nails used for attachment of the respective sections to the roof support are covered by the overlapping of adjacent sections and thus unexposed.

It is a further object of this invention to provide such a roof wherein all exposed joints between the sections comprise sharp edges held in contact with plane surfaces by the resiliency of the material of which the respective sections are formed.

It is a further object of this invention to provide a section or plate having secured thereto a connecting pin adapted to cooperate with a suitable aperture in an adjacent section to rigidly secure these sections together as well as to lock them into secure engagement with two other adjacent sections.

It is a further object of this invention to provide in such a section integrally formed downwardly directed gutters with surfaces disposed in a plurality of planes which, in addition to providing an air space between the edges of adjacent sections for the prevention of leakage by capillarity, will provide drainage gutters for the purpose of directing collected or condensed water downwardly to the surface of the section therebelow, whereby it will be drained from the roof.

It is a further object of this invention to pro-

vide in such a section a locking pin adapted to cooperate with a suitable aperture in an adjacent section, and to have a wedging or camming action whereby to securely force the edges of the joints together and to retain them in such engagement regardless of contraction and/or expansion of the roof due to changes in temperature.

It is a further object of this invention to provide utmost ease in the assemblage of the sections.

These and other advantages will appear from the following description taken in connection with the drawings.

In the drawings:

Figure 1 is a plan view of a typical roof portion showing four complete sections attached together;

Figure 2 is a partial sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a partial sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a fragmentary view showing a modified form of connecting or locking pin; and

Figure 5 is a perspective view showing the engagement of three of the sections illustrated in Figure 1; and

Figure 6 is a partial section, similar to Figure 3, of the modification shown in Figure 4, as taken along the line designated 6—6.

Referring to the drawings in detail, the respective sections or plates have been designated A, B, C and D respectively. These sections are identical. Each section has a body portion 1 which is substantially planar. The sections are each provided at their extreme upper corner with a boss 2 which terminates outwardly in an extension 3 and which boss 2 is adapted to support the securely attached connecting pin or locking pin 4 which extends through aligned apertures 2a and 2b in the boss 2 and which has its upper or rear end disposed in the recess 2c of the boss 2. The forward or lower pointed end of the pin 4 projects forwardly or downwardly beyond the inner or forward sloping surface of the boss 2, as shown particularly in Figure 3. Each pin 4 fits tightly in the apertures 2a and 2b and is frictionally held in position therein by reason of the inherent resiliency of the body material of the plate or section. The inner portion of the boss has a downwardly sloping surface 5.

The upper edges of the sections adjacent the boss 2 on opposite sides thereof are provided with an outer elongated boss or corrugation 6 and an inner elongated boss or corrugation 7 spaced from and disposed inwardly of the corru-

gation 6. The upper end of the outer corruga-
 tion 6 extends into the extension 3 which termi-
 nates in a downward prong 3a which is prefer-
 ably sufficiently sharp to penetrate the surface
 5 of the roof support. If it is desired, however,
 this prong may be bent inwardly under the body
 of the section. In any case, the flanges on the
 upper side edges will space the surface of the
 plate from the roof support. The lower end of
 10 the corrugation terminates in the bent-up sur-
 face 8 at the corner of the plate or section. The
 upper end of the inner corrugation 7 extends
 into the upper portion of the corrugation 6 ad-
 jacent but spaced from the boss 2. A groove 9
 15 is thus formed between the upper inner surface
 of the corrugation 7 and the adjacent side of the
 boss 2. The lower end of the inner corrugation
 7 is preferably tapered and terminates adjacent
 a lower side of the plate or section.

20 A groove or gutter having sloping sides and
 an upper end portion is formed between the
 corrugations 6 and 7 and is designated 10. The
 two lower diagonal sides of the plate or section
 are substantially straight and terminate in the
 25 lower locking flange or connecting flange 11
 which is provided with a transverse stepped por-
 tion 12. Formed substantially centrally of the
 vertical part of the transverse stepped portion 12
 is an aperture 13 which is adapted to cooperate
 30 with the locking pin 4 of the next lower adjacent
 plate or section.

The edges of the respective plates or sections
 are provided with downwardly extending lips or
 flanges 14 which extend around the border of the
 35 plate or section from substantially adjacent the
 extension 3 of the boss 2 to the flattened por-
 tions 15 adjacent the locking or connecting
 flange 11. The flattened portions 15 cooperate
 with the surface 1 of the adjacent plate or sec-
 40 tion to provide apertures 15a for the escape of
 collected moisture from the grooves or gutters
 10 adjacent thereto. The corrugations 6 are
 provided with suitably located holes or aper-
 tures 16 which are adapted to accommodate
 45 nails or the like, which are used to secure the
 plates or sections to the roof support.

In Figure 4, I have illustrated a modified form
 of connecting pin or locking pin which is desig-
 nated 4a and which is applied to a plate or sec-
 50 tion construction similar to that shown in Fig-
 ures 1, 2 and 3, and described above, save for the
 provision in the boss 2 thereof of pairs of suitably
 aligned and spaced apertures 2a and 2b (as
 55 shown in Figures 4 and 6) for receiving the
 parallel pin portions of the U-shaped, or staple
 shaped, locking pin 4a. It is, of course, to be
 understood that when a locking pin of such form
 is used, a pair of apertures 13a will be suitably
 60 located in the vertical part of the stepped por-
 tion 12 of the respective plates or sections.

As shown in Figure 2, the cooperation of the
 corrugations 6 and 7 with the under surface of
 the body portion 1 of the adjacent plate forms
 65 two air spaces and two drainage gutters for the
 drainage of moisture. As is also shown in Figure
 2, the lip or flange 14 of the plate D has sub-
 stantial line contact with the upper surface of
 the body portion 1 of the adjacent lower plate B.

70 With reference particularly to Figure 3, it
 will be seen that the downwardly extending ex-
 tremity of the extension 3 will cooperate with
 the roof support to secure the respective plates
 or sections in position. This action is enhanced
 75 by the fact that the plates are placed in tension

when locked together by the inclined surface of
 the connecting pin or locking pin 4.

With reference particularly to Figure 1, it
 will be seen that the corner portions 8 and cor-
 rugations 6 and 7 with their interposed groove
 5 or gutter 10 of the plates or sections C and D are
 entirely covered by the plate or section A. The
 nails or the like which extend through the holes
 or apertures 16 cooperate with the connecting
 10 pins 4 to place the entire plate A under tension
 whereby to secure the connecting flange 11 and
 the lips or flanges 14 thereof into secure engage-
 ment with the surfaces of plates or sections B, C
 and D. The entire surface of the plate A is
 15 inclined and the inherent resiliency of the plate
 or section tends to retain the lips or flanges 11
 and 14 in engagement with the respective planar
 surfaces regardless of the expansion or con-
 traction of the plates due to temperature
 20 changes.

Moisture collecting between the lower edge
 portions of the plate or section A and the respec-
 tive plates or sections B, C and D will drain
 downwardly through the grooves or gutters pro-
 25 vided between the corrugation 7 and the lip or
 flange 14 and between the corrugation 7 and the
 corrugation 6. This moisture is enabled to
 escape through the aperture provided between
 the plate or section A and the plates or sec-
 30 tions C and D by the flattened portions 15 of
 the plate or section A. The cooperation of the
 inclined surface of the pin 4 with the aperture
 13 securely locks the plates A, B, C and D to-
 gether and secures the respective lips or flanges
 35 14 and the connecting flanges 11 in engagement
 with the respective supporting plane surfaces.

The nails, tacks or the like inserted through
 the holes or apertures 16 in the respective plates
 serve to lock the corner portions 8, which are
 bent slightly upwardly, securely downwardly on
 40 the supporting surfaces thereunder provided by
 the next lower plate. With reference to Figure
 3, it may be understood that the sections are
 drawn downwardly by the nails in the apertures
 16 and by the pin 4 which bends each section
 45 over the boss 2 of the plate next below to retain
 the section under tension.

With reference particularly to Figures 1 and
 2, it will be noted that there are three points of
 contact between the plate or section B and the
 50 adjacent plate or section D at their overlapping
 sides. The same is true of the other plates or
 sections. Likewise, the lip or flange 14 of each
 upwardly disposed side has substantial line con-
 tact with the roof support, as does the above-
 55 described extremity of the extension 3 of each
 plate. This provides for the utmost efficiency
 in securing the respective plates upon the roof
 support because of the substantial line contact
 of the respective plates with the roof. This is,
 60 of course, enhanced by the fact that due to the
 action of the inclined surfaces of the locking
 pins 4 and the particular shape of the respective
 sections, these sections are constantly held under
 tension which constantly urges the respective
 65 lips or flanges and the respective projections of
 the extensions 3 downwardly against the roof
 support. Due to the extremely efficient locking
 action accomplished by means of pins 4, an ex-
 tremely large roofing surface may be laid with
 70 the use of nails only on the lowest line and the
 uppermost line of plates or sections.

Removal of the roof is extremely easy and may
 be accomplished by pulling the nails or tacks in
 75 the uppermost line of sections, as for instance A,

and then sliding these sections downwardly whereby to remove the aperture 13 therein from the locking pin 4. This procedure may be continued until the entire roof is removed. This greatly facilitates the operation of salvage, and the attachment of the sections or plates is such that they may be removed and used over and over again. Likewise, a portion of the roof may be removed and a single plate or section replaced when such replacement may become necessary.

When the modified form of locking pin is used, a substantially tighter joint is achieved due to the fact that there is twice as much locking surface as when a single type of locking pin is used. Furthermore, there is no tendency for the locking pin 4a to move downwardly with respect to its supporting boss or to the left, as shown in Figure 4, when a superposed plate or section is removed therefrom.

It will thus be seen that I have produced a roof structure which may be applied to a roof support with the utmost ease and which may be likewise removed with equal facility. Furthermore, the utmost insulating value is achieved by the provision of air spaces underneath the respective plates or sections. Another extremely advantageous feature is that the resiliency of the material from which the respective plates or sections are fashioned is utilized to the utmost to retain the respective lips or flanges in knife-edge engagement with their respective plane surfaces regardless of expansion and/or contraction of the respective sections during changes of temperature.

It is likewise to be noted that my roof construction presents a surface which is extremely free from projections or obstructions, which facilitates the application of coverings by the use of paints or the like and that the utmost efficiency of coverage is achieved due to the fact that the overlapping portions are made to accomplish multiple functions. Likewise, foreign matter such as leaves, etc. will not collect on the roof surface due to the elimination of retaining cracks, ridges, projections and/or other rough surfaces.

It will be understood that the above described structure is merely illustrative of structure by which my invention may be carried out and that I desire to comprehend within my invention such modifications as come within the scope of the claims and the invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a roof construction, a plurality of resilient non-planar plates having overlappingly engageable marginal flanges and having at opposite corners complementary interlocking means including interpenetrating pins and complementary apertures adapted when interengaged to bend the flanges of said plates and interlock four adjacent plates together under tension.

2. In a roof construction, a plurality of overlapping resilient non-planar plates having complementary overlappingly engageable flanged edges and complementary interlocking means including interpenetrating pins adapted when in engagement to bend said plates and secure four adjacent overlappingly engaged plates together with their flanged edges retained in engagement with overlapped surfaces of adjacent overlapped plate edges.

3. In a roof construction, a pair of resilient plates having complementary overlapping flanged

edges engageable to secure adjacent plates against relative lateral movement, said plates being non-planar and having interengaging means adapted to lock said plates together under tension to retain said flanges by the tension of the plates in engagement with overlapped surfaces of adjacent plates, said interengaging means comprising an aperture in one plate and a pin frictionally attached to the other plate and adapted to be received by said aperture.

4. In a roof construction, a plurality of overlapping resilient plates having flanged edges overlappingly engageable to prevent relative lateral movement between adjacent overlappingly engaged plates, said plates being non-planar and provided with cooperating means comprising apertures and engaging pins engageable to lock the flanged edges in engagement with overlapped surfaces of adjacent plates by the inherent resiliency of the plates.

5. In a roof construction, a plurality of diagonally disposed overlapping resilient plates having flanged edges, some of said edges being provided with paired corrugations forming gutters, said plates being non-planar and provided with cooperating pin and aperture means at diagonally opposite corners engageable to resiliently lock overlapping flanged edges in engagement with overlapped surfaces of adjacent plates inwardly of the gutters.

6. In a roof construction, a plurality of overlapping resilient plates having flanged edges, some of said edges being provided with paired corrugations forming gutters, said plates being non-planar, and cooperating pin and slot means on said plates engageable to resiliently lock the flanged edges in engagement with overlapped surfaces of adjacent plates inwardly of the gutters, each of said plates being provided at its lower portion with means adapted to provide drains for the gutters covered by the plate.

7. In a roof construction, a plurality of overlappingly engageable resilient plates each having a marginal flange with an aperture at one corner and a penetratingly attached pin at the diagonally opposite corner, each of said pins being adapted for interpenetrating engagement with adjacent plates to force the apertured flange of an overlapping plate against a surface of the overlapped plate to lock the plates together under tension.

8. In a roof construction, a plurality of overlappingly engageable marginally flanged resilient plates each having complementary means at diagonally opposite corners, each of said means comprising a pin penetratingly attached to one plate and a complementary aperture in another plate, said pin being in interpenetrating engagement with the adjacent plates locking overlappingly engaging marginal surfaces of four adjacent plates together under tension.

9. In a roof construction, a plurality of diagonally arranged plates having flanges on the upper side edges engageable with a roof support and flanges on their lower side edges engageable with complementary surfaces of adjacent laterally disposed overlapped plates to prevent relative lateral movement therebetween, each of said plates having at its lower corner aperture means adapted to cooperate with penetrating double pin means on the overlapped upper corner of an adjacent plate to secure the flanges and cooperating surfaces of four adjacent plates together.

10. In a roof construction, a plurality of over-

lappingly engageable diagonally arranged resilient plates having flanges on their upper side edges adapted to engage a roof support, a prong at their upper corners adapted to engage said roof support, and flanges on their lower side edges engageable with surfaces of adjacent overlapped plates to secure overlapped plates against relative lateral movement, each of said plates having integrally formed in its lower corner means adapted to cooperate with a pin in the upper corner of an adjacent plate to secure the cooperating overlapped surfaces of four plates together under tension.

11. In a roof construction, a plurality of diagonally arranged plates having flanges on their upper side edges engageable with a roof support and flanges on their lower side edges overlappedly engageable with complementary surfaces of adjacent overlapped plates to prevent relative lateral movement therebetween, each of said plates having a double pin at its upper corner engageable with apertures in the lower corner of an overlapping adjacent plate to secure the overlapping flanges and complementary overlapped surfaces of four adjacent plates together.

12. In a roof construction, a plurality of diagonally arranged plates having cooperating interlocking means at their upper and lower corners, said plates having flanges formed on each upper edge engageable with a roof support and flanges on each lower edge overlappedly engageable with complementary overlapped means on an adjacent plate, said interlocking means comprising a pin supported on one plate engageable with an aperture in another over-

lapping plate to secure the overlapping edge portions of four adjacent plates together.

13. In a roof construction, a plurality of diagonally arranged plates having cooperating interlocking means at their upper and lower corners, said plates having flanges formed on each edge, said interlocking means comprising a plurality of apertures in one plate and cooperating penetrating means on the other plate adapted to secure the overlapping edge portions of the plates together.

14. In a roof construction, a plurality of diagonally arranged overlappedly engageable resilient plates having cooperating interpenetrating means between the upper and lower corners of adjacent plates, said plates having gutters formed adjacent their upper side edges and flanges formed on each edge, the flanges of the lower edge portions of said plates covering the gutters of adjacent plates, and said interpenetrating means comprising pin means penetratingly secured to one of said plates and cooperating aperture means on the other plate penetratingly receiving said pin to urge the flanges of the overlapping plates against surfaces of the overlapped plates to secure the overlapping edge portions of four plates together under tension.

15. Locking means for securing a pair of adjacent resilient roof plates together comprising a tapered pin penetratingly attached to one plate and frictionally secured thereto by the inherent resiliency of the plate material and a cooperating aperture in the other plate.

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