

F. M. VOGAN.
METALLIC TILE FOR ROOFING.
APPLICATION FILED JULY 19, 1909.

1,125,414.

Patented Jan. 19, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

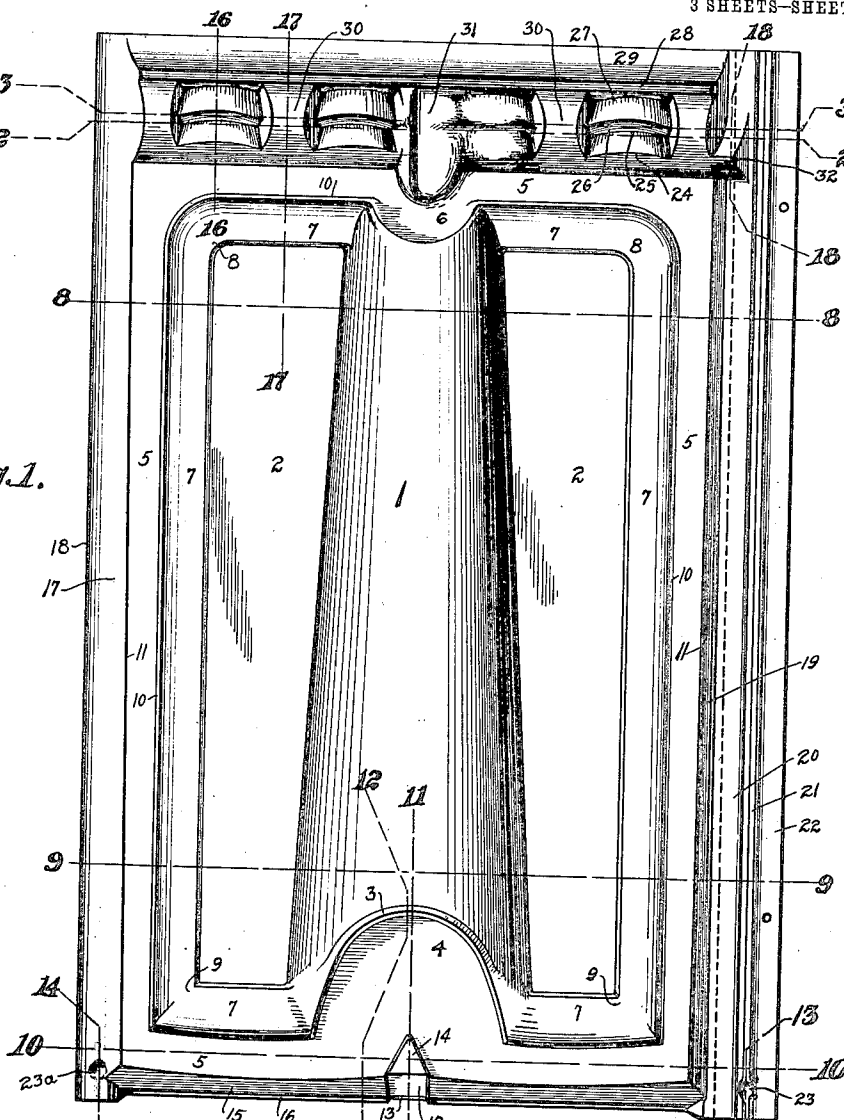


Fig. 2.

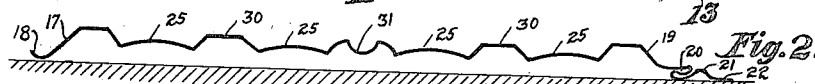
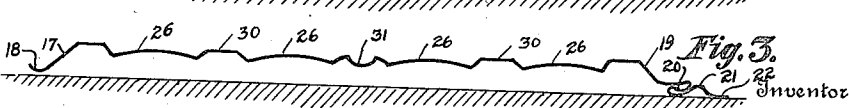


Fig. 3.



Witnesses

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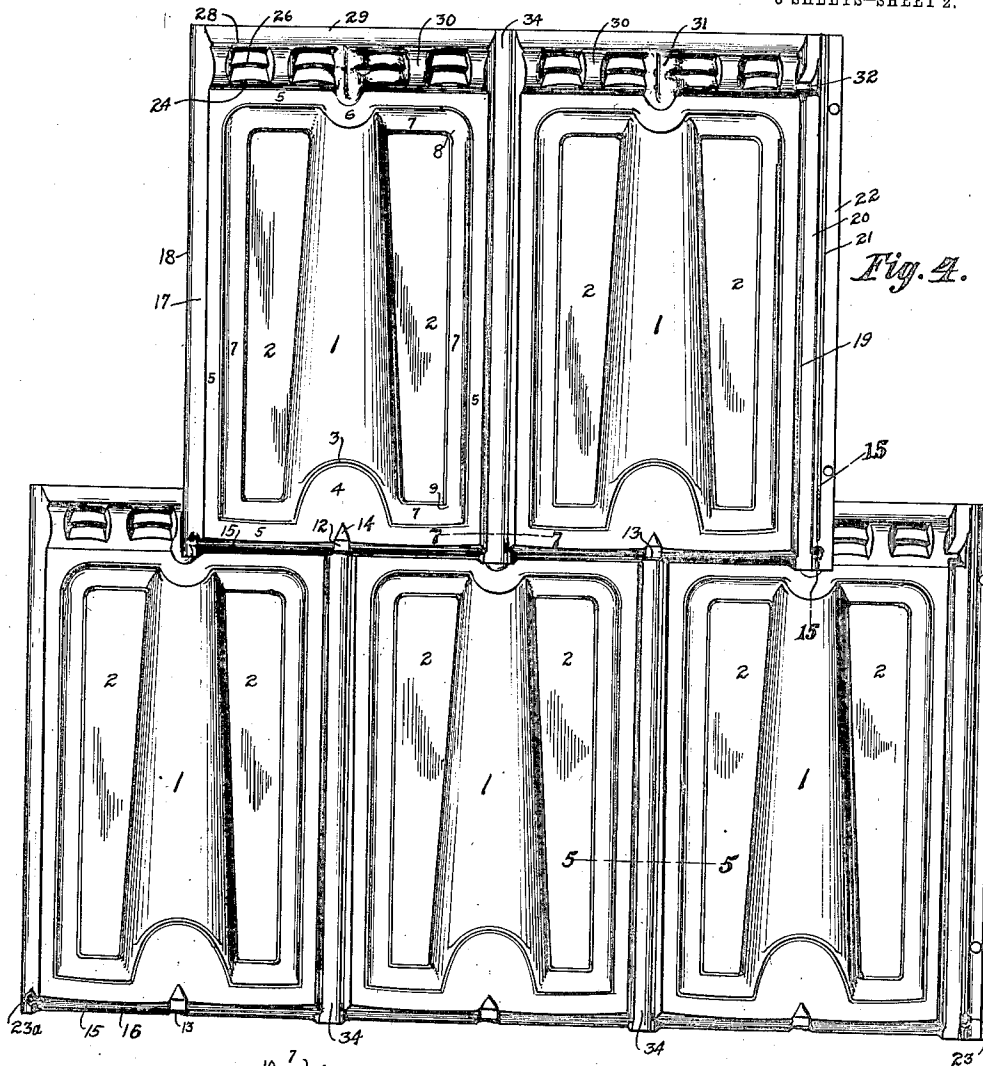


Fig. 4.

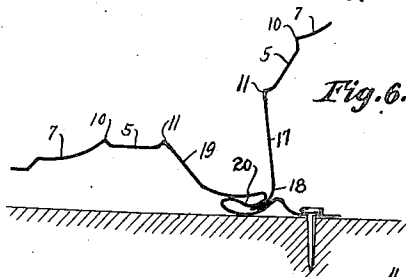


Fig. 6.

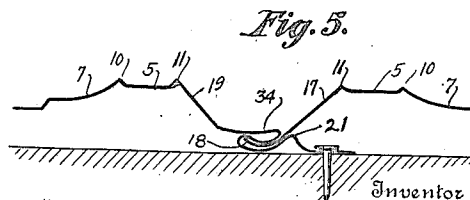


Fig. 5.

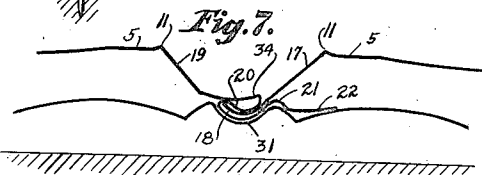


Fig. 7.

Witnesses

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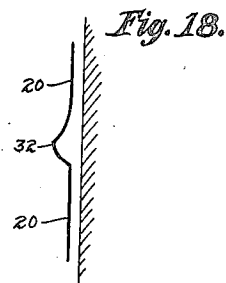
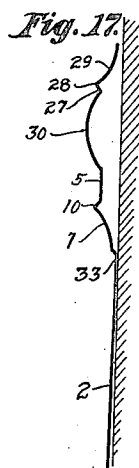
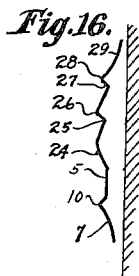
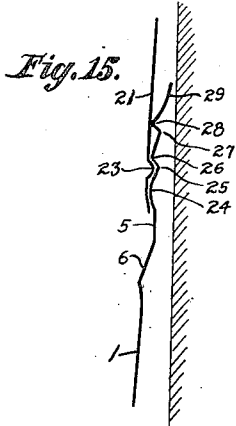
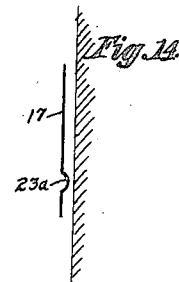
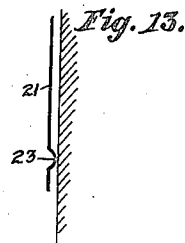
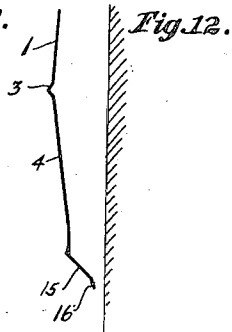
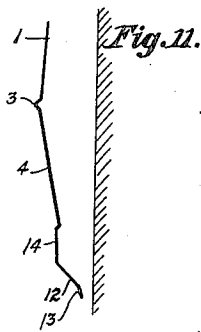
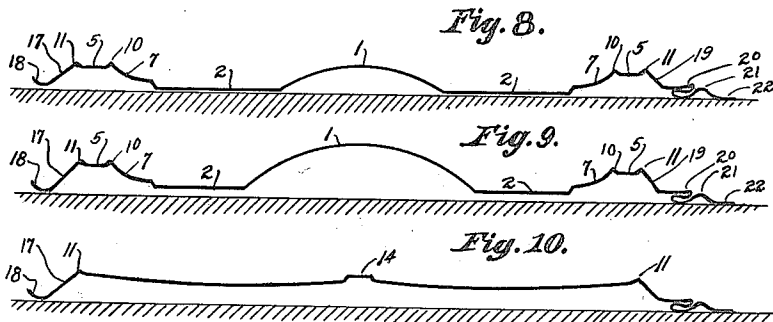
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3 SHEETS—SHEET 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANK M. VOGAN, OF CANTON, OHIO.

METALLIC TILE FOR ROOFING.

1,125,414.

Specification of Letters Patent.

Patented Jan. 19, 1915.

Application filed July 19, 1909. Serial No. 508,548.

To all whom it may concern:

Be it known that I, FRANK M. VOGAN, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Metallic Tile for Roofing, of which the following is a specification.

My invention relates to improvements in metallic tile for roofing and has especial reference to provide means for conducting the water away from the joints and at the same time so stamp or press the tile that such pressing or stamping will not necessitate the retrimming of the sheets; but leaves the edges of the sheets so that the ends and sides of the sheets will not have to be trimmed or sheared but remain straight so that any desired number of tile or sheets can be joined together. These objects, together with other objects readily apparent to those skilled in the art, I attain by the construction illustrated in the accompanying drawing, in which—

Figure 1 is a plan top view showing a single tile, also showing the same properly stamped or pressed. Fig. 2 is a transverse section on line 2—2, Fig. 1. Fig. 3 is a transverse section on line 3—3, Fig. 1. Fig. 4 is a view showing a number of tile properly joined and lapped. Fig. 5 is a transverse section on line 5—5, Fig. 4. Fig. 6 is a transverse section on line 5—5, Fig. 4, showing portions of two tile brought into position to be hooked or connected together at their longitudinal edges. Fig. 7 is a transverse section on line 7—7, Fig. 4. Fig. 8 is a transverse section on line 8—8, Fig. 1. Fig. 9 is a transverse section on line 9—9, Fig. 1. Fig. 10 is a transverse section on line 10—10, Fig. 1. Fig. 11 is a longitudinal section showing the lower portion of a tile on line 11—11, Fig. 1. Fig. 12 is a similar view taken on line 12—12, Fig. 1. Fig. 13 is a section on line 13—13, Fig. 1. Fig. 14 is a similar view taken on line 14—14, Fig. 1. Fig. 15 is a section on line 15—15, Fig. 4. Fig. 16 is a section on line 16—16, Fig. 1. Fig. 17 is a section on line 17—17, Fig. 1. Fig. 18 is a section on line 18—18, Fig. 1.

Throughout the several views similar numerals of reference indicate similar parts.

The tile herein described are intended to be made of sheet metal and are of such form in cross-section in their various parts, or in other words in such relief in their various parts as to accomplish the purposes set

forth above, as well as other objects herein-after to appear, while permitting of a firm and substantial seating of the tile upon the roof sheeting or boards to which the tile are intended to be nailed. In accomplishing the results desired a design is pressed or embossed in the sheet metal, the said design being of artistic character while having practical utility in the proper disposition of water falling upon said tile.

Each tile is provided with a raised, central, longitudinal, oval bead 1 occupying a considerable portion of the body of the tile and extending from a point near the bottom of said tile to a point near the top, each of said beads terminating short of both bottom and top edges. From an inspection of Figs. 8 and 9 as well as Fig. 1 it will be seen that the said bead 1 is of less width and of less projection on the line 8—8 than upon the line 9—9, the said bead thus being of tapering form from the bottom to the top of the tile. Upon both sides of the central bead 1 are the panels 2—2 extending longitudinally for a distance substantially equal to the length of the bead 1, the said panels being of less transverse dimension at their lower ends than at their upper ends, as illustrated in Fig. 1, and as will be noted from a comparison of Figs. 8 and 9. The variation in the width of the panels 2 is sufficient to compensate for the taper of the bead 1, and the outer vertical edges of the panels 2 are thus parallel with each other.

At the lower end of the bead 1 is arranged a rib 3 projecting slightly above the general surface of the bead 1 and extending over the lower end of said bead in a substantially semicircular form in plan view as illustrated in Fig. 1, defining a flattened inclined surface 4 merging in the surface of the lower high relief frame portion 5 to be hereinafter more fully described. At the upper end of the bead 1 the inclined flattened portion 6, arising in the curved surface of the upper end of the said bead, merges in the surface of the upper portion of the high relief outer frame 5 in a similar manner.

It will be noted from an inspection of Fig. 9 that the bead 1 does not have any very considerable projection upwardly from the plane of the tile, said bead being in fact relatively flat but the flattened inclined surface 4, cutting the bead at an angle, and especially when sharply defined by the rib 3,

causes the bead 1 to appear much higher than it really is when tiles of my invented construction are in place upon a roof. Upon looking up at a roof upon which such tiles
 5 are used the eye will naturally be impressed by the lower inclined flattened surfaces 4 of the various tile, and the rib 3 sharply defining such inclined surface will assist in giving the impression that the projection
 10 of the bead 1 upwardly from the general plane of the tile is very considerable. This feature adds very greatly to the architectural value of the tile without adding to the cost of manufacture, without using so
 15 much material, and without stretching the sheet metal unduly.

At each side of the bead 1 the mold 7 arises at the side of the top end of the bead 1, extends transversely across the top edge
 20 of the panel 2, makes a turn at right angles at the point 8, follows down the vertical outer edge of the panel 2, again turns substantially at right angles at the point 9, and following the lower horizontal edge of the
 25 panel 2, terminates in the side of the lower end of the bead 1.

From an inspection of the figures, especially Figs. 8 and 9, it will be seen that the high relief frame portion 5 has a flattened
 30 surface which is the greatest projection upon the exposed surface of the tile with the exception of portions of the bead 1 and the ribs 10 and 11 and portions of the gather-work at the top of the tile, to be hereinafter more fully explained. It will be
 35 understood that the molds 7 are comparatively shallow and the ribs 10 and 11 are for the purpose of more sharply defining the outlines of the various parts when the tile is viewed from a distance as well as for the
 40 purpose of preventing cross drainage of water. It should be noted that the rib 10 is co-extensive in length with the molds 7 on each side of the tile and that the said rib
 45 on the lower transverse portion of the mold 7 unites with the lower end of the rib 3 on each side of the inclined surface 4, thus forming a continuous rib across the bottom portion of the tile. From an inspection of
 50 Fig. 1 it will be seen that the transverse portion of the rib 10 at the lower end of the tile, intermediate the rib 3 and the corner 9 is slightly depressed, thus forming a more favorable place for the overflow of water at
 55 that point.

The rib 11 extends longitudinally from top to bottom of the tile, defining the outer limit of the side portions of the high relief frame portions 5. The said rib 11 is preferably
 60 not of greater projection than the rib 10.

At the extreme lower edge of the tile and located in the median line of the bead 1 is a depression 12 having a downwardly
 65 inclined surface, as shown in Fig. 11 and ter-

minating in the narrow flange 13 spaced upwardly from the roof sheeting to which the tile is adapted to be connected. Immediately above the depression 12 is a triangular projection 14 adapted to divide any
 70 water which is flowing downwardly along the median line of the tile over the surface 4 and distribute the same at the sides of the depression 12.

A further practical purpose in providing
 75 the projection 14 is to compensate for the drawing in the metal produced by making the depression 12.

From an inspection of Fig. 10 in connection with Fig. 1 it will be seen that from
 80 the sides of the projection 14 to the rib 11 on each side of the tile the high relief frame portion 5 extends, with a smooth surface slightly concaved from the projection 14 and the rib 11 to a point intermediate
 85 said projection and rib on each side of the tile. The lower edge of the tile from the sides of the depression 12 to a point substantially in line with the rib 11 on either side is inclined as shown at 15 in Figs. 1
 90 and 12 and terminates in the flange 16 adapted to over-lap a lower row of tile, and to engage the surface of the high relief frame portion 5 at the top of one of the
 95 panels of a lower tile and to hug said surface. This flange, being disposed at an angle to the inclined portion 15 aids in strengthening the edge and also provides considerable bearing face between the two
 100 tiles to aid in making a tight transverse joint.

The longitudinal edges of the tile are so formed as to permit adjacent tile in each horizontal course or row to inter-lock at their meeting edges. To this end one of
 105 said edges is shaped to form a groove into which the tongue of an adjacent tile is adapted to be inserted. It is immaterial which side of the tile is provided with the tongue and which is provided with the
 110 groove. In the drawings I have illustrated the tile as provided with a tongue on the left edge and a groove on the right. Proceeding to describe the formation of said tongue and groove, it should be noted with
 115 respect to the tongue upon the left-hand side that the portion 17 constitutes a downwardly inclined surface extending from the rib 11 downwardly and outwardly and terminating in the curved tongue 18 of a pre-
 120 determined standard of curvature, the said tongue extending from the extreme upper edge of the tile to the extreme lower edge, the inclined surface at 15 terminating in the portion 17 as illustrated in Fig. 1.

Referring now to the right hand edge of the tile, an inspection of Figs. 2 and 3, or
 125 S, 9 or 10 will disclose an inclined portion 19 descending from the rib 11, returned twice upon itself at the point 20, 130

arising to form the projection 21 immediately adjacent the returned portion, and terminating in the nailing flange 22 adapted to lie in close engagement with the roof sheeting. It should be noted that the groove formed by the double return of the metal at the point 20 is curved in cross section, but that the radius of the curvature of said groove is different from the radius of the predetermined curvature of the tongue 18.

Referring now to Figs. 5 and 6 it will be noted that the tongue 18 may be inserted within the groove at 20 by holding the tile having the tongue to be inserted at an angle to the plane of the roof as shown in Fig. 6, slipping the said curved tongue 18 within the curved groove, and bringing the tile with the inserted tongue down and into engagement with the roof sheeting, whereupon the relative position of the tongue and groove illustrated in Fig. 5 will result. It should be noted that the projection 21 engages the underside of the portion 17 and that the curved tongue engages the sides of the groove at two points because of the difference of curvature between said tongue and said groove, thus forming a tight joint between the two adjacent tiles interlocked while providing for their easy and ready interlocking or assembling. After all tiles have been arranged upon the roof, if it is desired to paint the same for the purpose of protecting the metal parts from the corrosive action of dampness and air, the ribs 11 upon adjacent tiles at each interlocked seam will aid in drawing sufficient paint from the brush to flow down the inclined sides or portions 17 and 19, permitting the said paint to drain into the tongue and groove joint or seam where it will form an unusually heavy coating, thus effectually sealing the joint against corrosive action of water and air.

Near the bottom edge of the tile the indentation 23 is arranged in the projection 21, and a corresponding indentation 23^a in the curved tongue and inclined portion 17 of the interlocking tile is adapted to enter the said indentation 23 for the purpose of alining the tile to form perfectly straight courses or rows. In Fig. 13 I have shown the indentation 23 extending substantially to the surface of the sheeting. In Fig. 14 I have illustrated the indentation in the portion 17 as extending a less distance toward the sheeting, thus adapting it to fit within the indentation 23.

In arranging the tile in courses or rows upon the roof, one of the chief objects of the construction is to arrange the panels 2 of each tile above the two panels of two adjacent tiles of the row immediately below. This arrangement is well illustrated in Fig. 4 where it will be seen that the tongue and

grooved joint between adjacent tiles of the lower row is in line with the median line of the bead 1 of the tile immediately above. One of the panels 2 of said tile immediately above is therefore in line with a panel of one of the tiles immediately below. While the other panel of the tile immediately above is in line with the panel of another tile in the row, immediately below it.

From an inspection of the figures it will be readily noted that the relief of each tile is such as to throw practically all water falling upon it upon the panels 2. All water falling upon the bead 1 will have a tendency to flow sidewise into one or other of the adjacent panels and the rib 3 will prevent any water flowing downwardly beyond said rib on the bead 1. Water falling upon the high relief frame portion 5 will be guided in its course by the beads 10 and 11 and caused to flow practically in a line straight down the tile. Water falling on the mold 7 will be drained onto the panels 2 and it will be noted that the shape of said panels together with the concave surface between the projection 14 and the rib 11 noted in connection with Fig. 10 will tend to cast the water from an upper tile in a single narrow stream upon one of the panels of a lower tile, it will in turn carry the water downwardly and cast it upon the panel of the next lower tile. It should be noted that the entire arrangement is intended to protect the seams or tongue and groove joints and in this connection it should be noted that any water falling upon the surface 4 will be divided by the projection 14 and thrown upon the high relief frame portions 5 of the tiles immediately below rather than upon the joint between said tiles.

In the formation, embossing or pressing of the tiles it will be understood that the formation of the portion heretofore described in detail will so draw the metal that if a gathered portion were not provided at the top edge of the tile the side edges of said tile would not be parallel. It is therefore necessary to corrugate or wrinkle the metal adjacent the top edge to compensate for the drawing of the metal in the other portions of the tile. To this end a double series of indentations is produced, preferably in the form illustrated in the drawing.

From an inspection of Figs. 16 and 17 taken in connection with Figs. 1, 2 and 3, an understanding of the projection or the relief of the gathered portion of the tile may be obtained. It will be noted from an inspection of Fig. 16 that from the high relief frame portion 5 the surface of the tile rises into the projection 24, whence it descends into the corrugation 25, again arising into the projection 26, descends into the corrugation 27, arising into the projection 28 and thence descends in the

inclined surface 29 toward the roof sheeting at the extreme upper edge of the tile. Intermediate transversely adjacent corrugations are formed in the portions illustrated in section in Fig. 17 which constitute upwardly rounded surfaces 30, which together with the corrugations before mentioned aid in gathering or puckering the metal in such way as to avoid the necessity of retrimming the edges of the tile after they have been pressed. In line with the median line of the bead 1 is a longitudinally disposed rounding depression 31 into which the rounded under surface of the tongue and groove joint of two joined tile immediately above are adapted to be seated, as illustrated in Fig. 7.

Adjacent the upper edge of the right-hand side of each tile is the projection 32 which is formed substantially in line with the center of the seam or joint when two adjacent tiles are interlocked and which is adapted to extend into the under side of the projection 14 of the tile next above it for the purpose of aiding in centering the same and of holding the same in proper position.

One of the objects of the invention is to so arrange the relief or projection of the tile that the greater portion of said tile will be held spaced from the surface of the roof sheeting to which the tile are nailed, thus permitting air to enter between the under surface of the tile and the roof sheeting to prevent the accumulation of moisture or dampness under said tile and thereby avoiding the rapid rusting or disintegration of the metal. To this end the projection of the various parts is such that there are but few parts of the tile in contact with the roof sheeting. The nailing flange 22 is of course adapted to engage the surface of the roof sheeting for its entire length and does so except in such cases as illustrated in Fig. 15, where the lower end of a tile is illustrated as over-lapping the top edge of a course of tile below it. A small portion of the nailing flange 22 will thus rest upon the tile beneath but the remaining portion of the said flange for its entire length to the top of the tile will rest upon the roof sheeting. The extreme upper portion of each of the panels 2 is adapted also to engage the roof sheeting, as illustrated at 33, but the said panels from their upper limits to their lower limits are so disposed as to extend farther and farther away from the surface of the roof sheeting as they near the bottom edge of the tile. The under portion of the groove on the right-hand edge of each tile is adapted also to rest upon the roof sheeting in much the same manner as the nailing flange 22 with which it is closely associated in position and function. As arranged upon the roof sheeting to constitute an entire roof covering,

therefore, each of the tile constituting said covering will have a bearing upon two of the tiles in the row or course next below it as well as along its right-hand or groove edge and at the upper ends of its panels 2. In laying the tile the nails are driven through the nailing flange 22 into the roof boards or sheeting and the tongue of an adjacent tile in the course is entered into the groove as illustrated in Figs. 5 and 6 and heretofore described. When the tile, thus having its tongue entered in the groove of an adjacent tile, is brought into the position illustrated in Fig. 5 nails are driven through its nailing flange into the roof boards and the next tile is then ready to be locked to the tile just mentioned by tongue and groove as before described. In arranging the tile in this manner the indentation 23 of each tile receives the corresponding indentation in the tongue of the inter-locking tile, thus alining all tiles of each row. The projection 32 of each tile enters the under side of the projection 14 of one of the tiles above it, and the inter-locked seam of each two tiles at their bottom edges rest in the depression 31 of the tile immediately below. The corrugations at the upper edge of each tile not only compensate for the stretching of the metal in the remainder of the tile but also are of such form as to prevent water from being blown up under the over-lapping tile above, thus preventing the said water from finding its way to the extreme top edges of the tile and onto the sheeting beneath. In thus preventing water from finding its way upwardly, the flange 16, pressing against the high relief frame portion 5 of the tile beneath it, aids materially and practically assures against leakage.

In Fig. 5 it will be noted that at the point 34 the exposed surface of the parts constituting the seam or joint between adjacent tiles has a slightly curved upper surface. The object of this curvature is to prevent the water upon said surface from entering the joint between the tongue and groove, the curved surface having a tendency to carry the water directly downwardly and deposit it upon the flattened portion 6 of the tile immediately below. As before mentioned, and as well illustrated in Fig. 11, the depression 12 has a downwardly inclined surface terminating in the flange 13, which flange is adapted in the assembled tile to form a roof covering to closely engage the surface 34 above mentioned. This engagement of parts together with the projection 32 lying immediately beneath the depression 12 and back of the flange 13 prevents any backing up of water along the joint or seam and under the lower edge of the upper tile.

The upwardly rounded surfaces 30 in the gather-work at the top of the tile prevents any water which may work up under the

lower edge of an upper tile from moving sidewise into the joint or seam near its upper end. It should also be noted that the lower edges of the projections 24 and 26 are curved downwardly at their outer ends, thus providing a surface well adapted to gather any moisture deposited upon it will drain the same downwardly at the corners.

I claim:

1. A tile for roofing formed from sheet metal, the upper portion of said tile adapted to be over-lapped by the lower ends of the tile of the next upper row on the roof and the lower portion of said tile adapted to be exposed to the weather, the exposed portion of said tile embossed, said upper portion provided with gather-work consisting of projections and corrugations arranged in the form of a double, transverse series with upwardly rounded portions disposed intermediate transversely adjacent corrugations in the series and the lower edges of said projections curved downwardly at their outer ends, substantially as and for the purpose specified.

2. A tile for roofing formed of sheet metal and provided with a central, longitudinally disposed raised portion, and the tile terminating at its extreme lower edge in the median line in a depression, the side edges of said tile provided with complementary inter-fitting portions adapted to form longitudinal, relatively depressed seams between laterally adjacent tiles when joined, and said depression at the extreme lower edge of the tile adapted to project into the depressed joint of two similar, joined tiles.

3. A tile for roofing formed from sheet metal, one side edge of each tile constituting a tongue, the other side edge provided with a groove adapted to receive the tongue of a laterally adjacent tile, upwardly inclined portions adjacent said tongue and said groove and adapted, when the adjacent tiles are arranged with the tongue of one tile in

the groove of the other tile, to define a longitudinal depression with downwardly convergent side walls, each tile provided with a longitudinally disposed, centrally located bead in high relief, said bead terminating at the lower end of the tile in a flattened downwardly inclined surface, an upwardly projecting portion at the lower edge of said inclined surface in the median longitudinal line of said tile, said projecting portion adapted to turn water flowing down said inclined surface to the sides of said median line, and a depression in the extreme lower edge of the tile immediately below said projecting portion, the depressed portion of said edge being adapted to enter the said longitudinally disposed depression between adjacent tiles of the next lower row on the roof, whereby water flowing down the surface of an upper tile will be prevented from flowing over the lower edge of said tile at the median line and will be diverted from the tongue and groove of adjacent tiles on the next lower row on the roof.

4. A tile for roofing formed from sheet metal, one side edge of each tile provided with a tongue and the other side edge provided with a groove, high relief portions adjacent said tongue and groove, a central longitudinally disposed portion in high relief, longitudinally disposed depressed portions intermediate said frame portions and said central portion and the lower edge of each tile provided at the median line with a depressed portion adapted to extend into the depression formed at the interlocking edges of two laterally adjacent tiles in the next row below said tile on a roof.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

FRANK M. VOGAN.

Witnesses:

WILLIAM H. MILLER,
IRENE LUTZ.