

May 27, 1941.

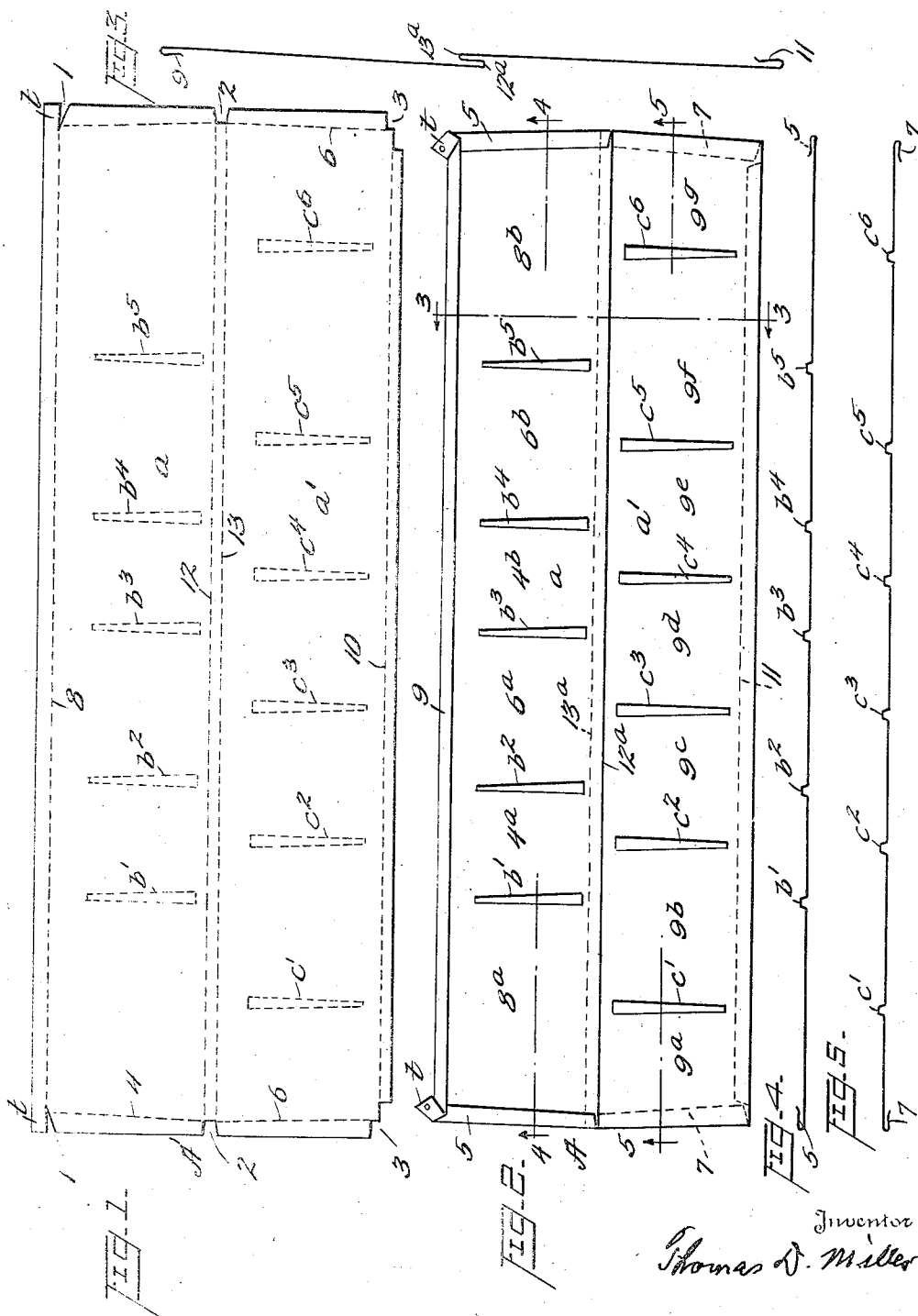
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METAL ROOF COVERING

Filed April 25, 1938

2 Sheets-Sheet 1



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Chloroform

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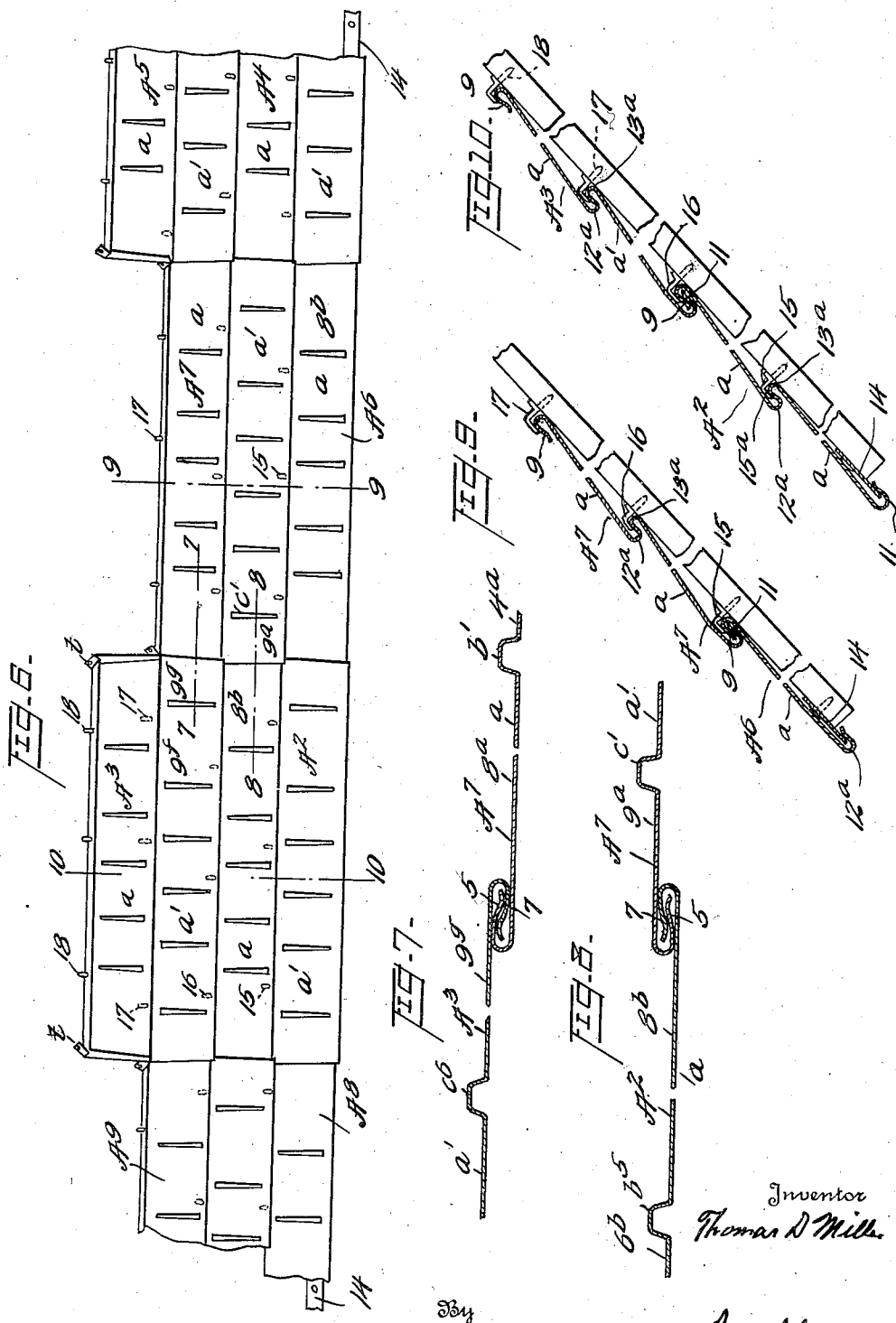
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METAL ROOF COVERING

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8 Claims. (Cl. 108—17)

This invention relates to a metal roof-covering composed of shingles of relatively large size, which are easy to handle and to assemble on a roof and which require a minimum amount of metal to cover the roof. The individual units are anchored to the roof and interlocked with one another in such a way as to permit expansion and contraction of each unit without affecting the other units. The nails which hold the units to the roof are all covered by the shingles and the interlocking connections between the shingles are so formed as to permit the free drainage of rain-water that may be driven into such connections, so that if the shingles and nails are made of oxidizable metal the water will not be retained to cause rust of the nails and the parts which they engage, which is a source of weakness in the anchorage of sheet metal roof-coverings in general. The shingles extend crosswise of the roof and are embossed on their upper sides with transverse ridges which strengthen the shingles so that relatively long shingles can be easily handled, and these ridges are so spaced on the upper and lower halves of each shingle as to divide the shingle into a plurality of panels, the panels adjacent one another on one half of the shingle being of different widths, and the ridges on one half of the shingle being out of line with those on the other half. The ridges and panels are so arranged that when the shingles are assembled on a roof this spacing of the ridges and panels is preserved throughout the assemblage, producing a random effect which is desirable from an architectural point of view.

In the accompanying drawings,

Fig. 1 is a plan view of a blank from which the shingle is formed;

Fig. 2 is a top plan view of one of the shingles;

Fig. 3 is a transverse section through the shingle on the line 3—3 of Fig. 2, on a larger scale;

Fig. 4 is a longitudinal section through the shingle on the line 4—4 of Fig. 2;

Fig. 5 is a similar section on the line 5—5 of Fig. 2;

Fig. 6 is a plan view of an assemblage of shingles as they appear on a roof;

Fig. 7 is a section on the line 7—7 of Fig. 6;

Fig. 8 is a section on the line 8—8 of Fig. 6;

Fig. 9 is a section on the line 9—9 of Fig. 6, and

Fig. 10 is a section on the line 10—10 of Fig. 6.

Referring to Fig. 1, A' represents a sheet metal blank for forming a shingle. The blank is rectangular in form, and a suitable size would be fifty inches long and eighteen inches in width

for forming a shingle of slightly less length and width. The blank is notched inwardly at its ends near its upper margin as indicated at 1 and also has notches 2 in its ends approximately midway between its side edges, and its lower corners are cut as shown at 3. The blank is embossed with transverse ridges hereinafter referred to.

In forming the shingle A, Fig. 2, the ends of the blank between the notches 1 and 2 are folded over the top of the blank along the sloping dotted lines 4, forming tapering over-turned flanges 5, as shown in Figs. 2 and 4 and the ends of the blank below the notches 2 are folded under the blank along the sloping dotted lines 6, forming under-turned tapering end flanges 7, as shown in Figs. 2 and 5. The upper margin of the blank is turned over the blank along the dotted line 8, Fig. 1, forming the over-turned flange 9, Figs. 2 and 3. The flange 9 overlaps the flanges 5 and the projecting ends *t* of flange 9 are bent upwardly and form tabs which may be perforated to receive nails. The lower margin of the blank is turned under the blank along the dotted line 10, forming an under-turned flange 11, as indicated in Figs. 2 and 3. This flange extends close to the flanges 7, but does not overlap or interfere with them because the ends of the flanges are cut off as shown at 3 in Fig. 1. The shingle is divided into an upper half *a* and a lower half *a'* by folding the blank reversely along the longitudinal dotted lines 12 and 13, Fig. 1, forming bends 12^a and 13^a, respectively, Figs. 2 and 3.

Before the blank is folded as described, it is embossed on its upper side with the transverse ridges *b*¹, *b*², etc. and *c*¹, *c*², etc. which taper toward its side edges and which stiffen the shingle and divide its exposed surfaces into a series of panels, the adjacent panels on the upper half of the shingle being of different widths and bearing a certain definite relation to one another as to widths, and the ridges on the lower half intersecting the panels on the first-mentioned half, whereby the panels on the second-mentioned half are differently spaced from those on the upper half and the ridges on both halves are out of alignment, giving a desired random effect in the completed shingle as to ridges and panels. When the shingles are assembled on a roof the random effect as to ridges and panels is preserved between the adjacent shingles, thus giving a random spacing effect throughout the roof covering, which is desirable from an architectural point of view.

In the upper half *a* of the blank and the

shingle, five embossed ridges, indicated at b' to b^5 , inclusive, are shown dividing that half into panels of three different widths. Thus, between the ridges b' and b^2 of the shingle, there is a panel 4^a and at the left of the ridge b' there is a panel 3^a twice the width of the panel 4^a , and at the right of the panel 4^a , between the ridges b^2 and b^3 , there is a panel 3^a one and one-half times the width of the smallest panel 4^a , the widths of the panels being measured from the longitudinal centers of the ridges. To the right of the panel 3^a , which is of intermediate width, there is a panel 4^b of the same width as the small panel 4^a , and to the right of the panel 4^b there is a panel 3^b of the same width as the panel 3^a , and next to this, at the right, is a panel 3^b of the same width as the large panel 3^a . The panels may be variously arranged, but the panels adjacent one another are of different widths. In the shingle shown in Fig. 2, the largest panels in the upper half of the shingle are at its ends.

Each of the ridges c' to c^5 on the lower half a' of the shingle bisects a panel on the upper half of the shingle. Thus, the ridge c' bisects the panel 3^a ; the ridge c^2 bisects the panel 4^a ; the ridge c^3 bisects the panel 3^a ; the ridge c^4 bisects the panel 4^b ; the ridge c^5 bisects the panel 3^b , and the ridge c^6 bisects the panel 3^b . Thus, the ridges on the lower half of the shingle are out of line with the ridges on the upper half and the panels are differently located. As the ridge c' bisects the panel 3^a on the upper half, the panel 3^a to the left of the ridge c' will have a width equal to one-half of the panel 3^a , while the panel 3^b will have a width equal to one-half of the panel 3^a plus one-half of the panel 4^a which the ridge c^2 bisects; the panel 3^c will have a width equal to one-half the width of the panel 4^a plus one-half of the panel 3^a which the ridge c^3 bisects; the panel 3^d will have a width equal to one-half of the panel 3^a plus one-half of the panel 4^b which the ridge c^4 bisects; the panel 3^e will have a width equal to one-half of the panel 4^b plus one-half of the panel 3^b which the ridge c^5 bisects; the panel 3^f will have a width equal to one-half that of the panel 3^b plus one-half of the panel 3^b which the ridge c^6 bisects, and the panel 3^g will have a width equal to one-half of the panel 3^b . The panels 3^a and 3^b at the ends of the lower half of the shingle, it will be noted, are each one-half of the width of the panels 3^a and 3^b at the ends of the upper half of the shingle. If desired, the arrangement of the ridges shown on the upper half of the shingle may be applied to the lower half and the bisecting ridges may be applied to the upper half.

Figs. 6-10, inclusive, illustrate the manner of assembling the shingles on a roof. A flat metal strip 14 is nailed to the roof along its lower edge, a part of the strip projecting a short distance beyond said edge. Nails 15 are driven into the roof in a horizontal row at a distance from the lower edge of the strip 14 which is approximately equal to one-half the width of a shingle, each nail having a shoulder which limits the distance which it can be driven into the wood and having an over-turned head 15^a. The lowermost shingle A^2 is applied by hooking its lower flange 11 under the strip and then sliding the shingle upward. This causes the flange to interlock with the strip and the bend 13^a in the shingle to pass under the over-turned heads of the nails 15, as shown in Fig. 10. Nails 16 are then driven at the upper end of the shingle and the heads of these nails bear upon its over-turned upper flange 9. The

next shingle A^3 in the vertical row is applied by hooking its lower flange 11 under the upper flange 9 of the lower shingle A^2 and by sliding the shingle A^3 upwardly, the flanges of the two shingles interlock and the bend 13^a in the upper shingle extends under the heads of a previously driven row of nails 17. Nails 18 are then driven into the roof and the heads of these nails bear against the over-turned flange 11 of the shingle A^3 . Succeeding shingles in the same vertical row are applied in the same manner. After each shingle is in place, it is preferably secured to the roof by nails driven through the tabs t . The tabs and all of the nails are covered and protected from the weather by the shingles.

At the right in Fig. 6 are shown the lowermost shingles A^4 and A^5 in a vertical row, which shingles are assembled in the same way as the shingles A^2 and A^3 . Each alternate vertical row of shingles commences at the bottom with a half shingle, one of which is shown at A^6 , Figs. 6 and 9, and this is succeeded by complete shingles, one of which is shown at A^7 . The half shingle A^6 is the same as the upper half of one of the complete shingles, including the longitudinal bend 12^a. The half shingle is pushed upwardly into place between the lower halves of the shingles A^2 and A^4 , the bent portion 12^a of the half shingle interlocking with the strip 14 as shown in Fig. 9, and its end flanges interlocking with the end flanges of the lower halves of the shingles A^2 and A^4 . The complete shingle A^7 is then slid upwardly into place, its lower flange 11 interlocking with the upper flange 9 of the half shingle A^6 , while the end flanges of its lower half a' interlock with the end flanges of the upper halves of the shingles A^2 and A^4 , as shown in Fig. 8, and the end flanges of the upper half of the shingle A^7 interlock with the end flanges of the lower halves of the shingles A^3 and A^5 , as shown in Fig. 7.

At the left of the shingles A^2 and A^3 are shown, partly broken away, a half shingle A^8 corresponding to the half shingle A^6 , and a complete shingle A^9 corresponding to the shingle A^7 . It is to be noted that in the assemblage shown in Fig. 6, the lower halves of the shingles in alternate vertical rows are in line with and interlock with the upper halves of shingles in intermediate rows so that the random spacing of the ridges and panels on the shingles is preserved throughout the assemblage.

As previously stated, each shingle, as it is laid, is preferably secured to the roof by nails driven through its tabs t , and while the shingles are relatively long and wide they are securely held in place on the roof by these tabs and by the nails having heads which engage the folds and upper flanges of the shingles. All of the nails are covered by the shingles and are thus protected from the weather. The only nails which pass through the shingles are those which are driven into the tabs. The interlocking flanges of the shingles are not close fitting and do not hold water by capillary attraction to any extent. As shown best in Figs. 7 and 8, the end flanges are bent so that they interlock with a minimum amount of surface contact with one another and with the bodies of the shingles, thus permitting free drainage of water and facilitating the sliding of one shingle with respect to the adjacent shingles when the shingles are being assembled on a roof. In metal shingles of considerable length and width, such as these, the weather changes cause a considerable amount of con-

traction and expansion of the metal, but because of the sliding connections between the shingles, expansion and contraction may take place in the individual shingles, without affecting one another, and the corrugations or ridges also assist in confining the expansion to the individual shingles. These corrugations also strengthen the shingles transversely, making them easier to handle than if they were plain sheets without the corrugations.

What I claim is:

1. A shingle comprising a rectangular metal sheet having in its central portion a double fold dividing it into upper and lower halves, each half having a plurality of spaced transverse ridges on its upper side dividing it into panels, the adjacent panels on one half being of different widths and the ridges on the other half intersecting the panels on the opposing half of the shingle.

2. A shingle comprising a rectangular metal sheet having in its central portion a double fold dividing it into upper and lower halves, each half having a plurality of spaced transverse ridges on its upper side dividing it into panels, the adjacent panels on one half being of different widths and the ridges on the other half bisecting the panels on the opposing half of the shingle.

3. A shingle comprising a substantially rectangular metal sheet having in its central portion a double fold dividing it into upper and lower halves, the upper half having over-turned end flanges and the lower half having under-turned end flanges, the upper half having a plurality of transverse ridges spaced apart longitudinally of the shingle dividing it into panels, the adjacent panels being of different widths, and the lower half having transverse ridges spaced apart and each intersecting a separate panel of the upper half.

4. A shingle comprising a substantially rectangular metal sheet having in its central portion a double fold dividing it into upper and lower halves, the upper half having over-turned end flanges and the lower half having under-turned end flanges, the upper half having a plurality of transverse ridges spaced apart longitudinally of the shingle dividing it into panels, the adjacent panels being of different widths, and the lower half having transverse ridges spaced apart and each bisecting a separate panel of the upper half.

5. A shingle comprising a substantially rectangular metal sheet having in its central portion a

double fold dividing it into upper and lower halves, the upper half having over-turned end flanges and the lower half having under-turned end flanges, one half having a plurality of transverse ridges spaced apart longitudinally of the shingle dividing it into panels, the adjacent panels being of different widths, and the other half having transverse ridges spaced apart and each bisecting a separate panel of the opposing half.

6. A shingle comprising a rectangular metal sheet having in its central portion a double fold dividing it into upper and lower halves, each half having a plurality of spaced transverse ridges embossed on its upper side dividing it into panels, the adjacent panels on one half being of different widths and the ridges on the other half intersecting the panels on the opposing half of the shingle, the ridges on said halves tapering oppositely from said fold.

7. A shingle comprising a rectangular metal sheet having in its central portion a double fold dividing it into upper and lower halves, one half having a plurality of spaced transverse ridges embossed on its upper side dividing it into panels of three different widths, namely, a plurality of relatively small panels of the same width, a plurality of relatively large panels, each approximately twice the width of a small panel, and a plurality of panels of intermediate width, each approximately one-half wider than one of said small panels, the ridges being arranged so that adjacent panels are of different widths, and the other of said halves having a plurality of spaced transverse ridges embossed on the upper side, each of the latter ridges bisecting one of the panels on said first-mentioned half.

8. A shingle comprising a rectangular metal sheet having in its central portion a double fold dividing it into upper and lower halves, one half having a plurality of spaced transverse ridges embossed on its upper side dividing it into panels of three different widths, namely, a plurality of relatively small panels of the same width, a plurality of relatively large panels, each approximately twice the width of a small panel, and a plurality of panels of intermediate width, each approximately one-half wider than one of said small panels, the ridges being arranged so that adjacent panels are of different widths and large panels are at the ends of said half, and the other of said halves having a plurality of spaced transverse ridges embossed on the upper side, each of the latter ridges bisecting one of the panels on said first-mentioned half.

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