L. N. BROWN.

ROOFING TILE.

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1,303,022.

Patented May 6, 1919.

Fig. 1.

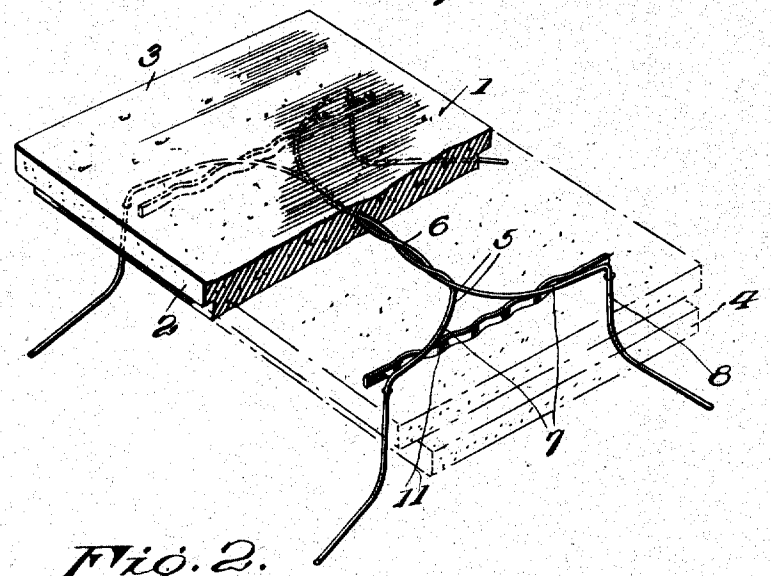


Fig. 2.

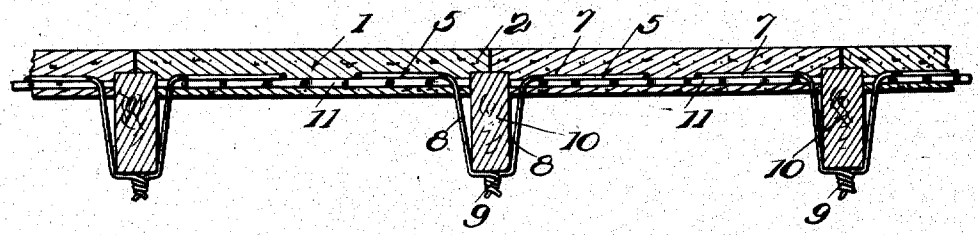
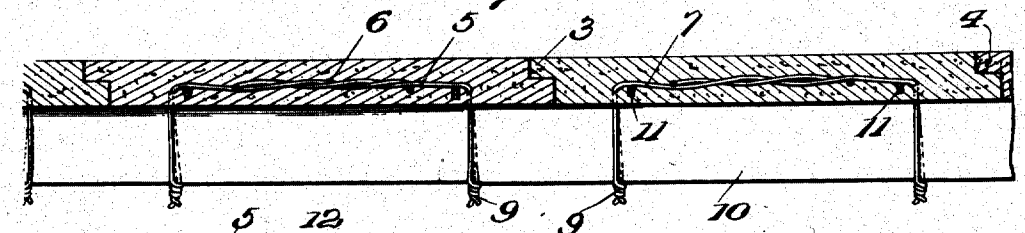


Fig. 3.



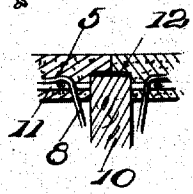


Fig. 4.

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UNITED STATES PATENT OFFICE.

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ROOFING-TILE.

1,303,022. Specification of Letters Patent. Patented May 6, 1919.

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To all whom it may concern:

Be it known that I, LLOYD N. BROWN, a citizen of the United States, residing at Charlotte, in the county of Mecklenburg and State of North Carolina, have invented certain new and useful Improvements in Roofing-Tiles, of which the following is a specification.

This invention relates to roofing tiles and has as its object to provide a roofing tile which may be readily and cheaply molded from cement or other plastic material and which when employed in the construction of a roof, will prove durable and water-proof and will possess numerous other advantages rendering it a desirable substitute for boards, shingles, and metal in roof structures.

One object of the invention is to so construct the tile that a number of tiles may be readily and conveniently laid upon any skeleton roof structure embodying rafters or similar timbers suitably spaced, and in such manner that after the tiles have been laid they will present a smooth upper surface to which a coating of tar or any other suitable material may be applied either over the entire faces of the tiles or along the seams between the tiles, so as to render the roof absolutely water-proof.

Another object of the invention is to provide a tile of the class mentioned with a reinforcing means which will serve also as a means whereby the tile may be anchored to the rafters of the skeleton roof structure so as to be securely held against displacement in any direction.

A further object of the invention is to so construct the tiles that in the completed roof structure every tile will be anchored to or connected with the tile or tiles at either or both sides thereof so that the roof structure produced will be substantially integral throughout.

The invention has as a further object to provide a tile of this class with supporting flanges at its opposite lateral edges which flanges are designed to rest upon the upper edges of the rafters with the flanges of adjacent tiles substantially meeting edge to edge above the upper edge of the rafter, the said lateral edges of the tiles beneath their said flanges constituting shoulders which abut against the opposing faces of the rafters so as to effectually provide against lateral displacement of any of the tiles.

Another object of the invention is to provide a tile constructed as above briefly pointed out, with reinforcing wires embedded therein and having their ends extending through and beyond the under face of the tile so that when the tiles have been laid upon the rafters, the projecting ends of the wires of adjacent tiles may be twisted together beneath the intervening rafters so as to securely anchor or tie the tiles to the rafters and further prevent displacement thereof.

The invention has as a further object the provision within each tile of transversely extending reinforcing elements which serve not only to strengthen the tile but which are also so located within the tile and with relation to the end portions of the wires first-mentioned as to effectually prevent these wires being torn through the under-side of the tile when the wires have their ends brought together and twisted in the manner above stated.

In the accompanying drawings:

Figure 1 is a perspective view of one of the tiles embodying the present invention, approximately one-half of the tile being broken away, however, so as to better illustrate the reinforcing or anchoring elements in the tile;

Fig. 2 is a vertical transverse sectional view through a roof structure illustrating the arrangement of the tiles with respect to each other and with respect to the rafters of the skeleton roof structure and also illustrating the manner in which the tiles are connected together and anchored to the said rafter;

Fig. 3 is a vertical longitudinal sectional view taken on a plane parallel to one of the rafters;

Fig. 4 is a detail vertical sectional view similar to Fig. 2, illustrating a slight modification of the invention.

The tile embodying the present invention may be molded from any desired cement mixture such as commonly employed in producing fence posts, building blocks, and similar articles, or it may be produced from any other material found suitable for the purpose, and in the drawings the tile is indicated in general by the numeral 1, and in general marginal contour is preferably of oblong rectangular form. Given a skeleton roof structure in which the rafters are spaced apart a uniform and predetermined

distance, the tiles for completing the roof structure will be of a width between their lateral edges substantially equal to the distance between the said rafters so that when the tiles are arranged upon and between the rafters, their lateral edges will abut against the opposing faces of adjacent rafters in the manner clearly shown in Fig. 2 of the drawings. In order that the tiles may be supported when so laid, each lateral edge of the tile is formed with a projecting flange 2 which is of a thickness substantially equal to one-half of the thickness of the body of the tile and which, therefore, occupies the upper half of the respective lateral edge of the tile as shown in the said figure. The flanges furthermore are of a width substantially equal to one-half of the thickness of the rafters of the skeleton roof structure so that when the tiles are laid in the manner shown in the said Fig. 2, the flanges of adjacent tiles will substantially meet edge to edge and the under-faces of the flanges will rest upon the upper edges of the rafters. In order that the meeting ends of adjacent tiles may be joined so as to render the roof substantially water-proof or leak-proof even without the application of any coating thereto, as heretofore referred to, one end edge of each tile, which is to constitute the lower edge if the roof is inclined, is formed with a flange 3 extending the entire width of the said end of the tile and constituting in effect a right-angular continuation of the flanges 2, being of the same thickness as the said flanges and occupying the same plane. The other end edge of each tile is formed with a rabbet 4 proportioned to receive the flange 3, as clearly shown in Fig. 3 of the drawings. When the tiles are molded of proper dimensions and the roof structure has been properly built, the tiles when laid will so meet or join one another that the roof structure will be substantially water-proof or leak-proof, but it will, of course, be usually desirable to apply a coating of tar or other suitable material along the seams between the tiles so as to fill or close the said seams. Of course, where the roof is to have a conformation other than flat, the bodies of the tiles will be molded accordingly and therefore the present invention is not limited to the flat side tile shown in the drawings, but the drawings on the other hand are to be taken merely as illustrative of the principles of the invention.

As before stated, combined reinforcing and tie wires are molded in the body of the tile and these wires are indicated in general by the numeral 5 and in preparing each tile, two of the wires have their intermediate portions twisted together as indicated by the numeral 6, the said intertwisted intermediate portions extending at the longitudinal middle of the body of the tile and lying substantially midway between the upper and under faces of the tile. Beyond their twisted intermediate portions, the wires are led either directly or indirectly laterally to points adjacent the corners of the tile as indicated by the numeral 7, and are thence trained downwardly substantially at right angles as indicated by the numeral 8, so that the ends of the wires will extend through and beyond the under-face of the tile. Of course, as there are two of the wires 5 in each tile, there will be four ends projecting beyond the said under-face of the tile, one located adjacent each corner of the tile. The projecting ends of the wires are of such lengths that when the tiles are laid upon the rafters in the manner shown in Figs. 2 and 3 of the drawings, the corresponding ends of the wires of laterally adjacent tiles may be brought together beneath the intervening rafter and twisted as indicated by the numeral 9 and clearly shown in Figs. 2 and 3 of the drawings. Of course, when the ends of the wires are twisted together the projecting end portions will be tensioned so as to firmly draw the flanges 2 down on to the upper edges of the rafters and the tiles will in this manner be firmly bound or anchored in place and prevented from being displaced in any direction.

In order to effectually anchor the portions 7 of the wires 5 in the tile and prevent the wires being torn through the under side of the tile when their ends are twisted together beneath the rafters 10, reinforcing bars or rods 11 are embedded in the tiles and these bars or rods are preferably corrugated throughout their lengths. The bars or rods 11 are so located that their ends will extend beneath the portions 7 of the wires 5, one of the bars 11 being located adjacent each end of the tile body and extending transversely thereof. In this manner the wires 5 are effectually prevented from being pulled through the tiles and additional reinforcement is given the tile.

If desired or found necessary, a strip 12 of heavy cloth material, carpet or in fact any yieldable material may be laid or secured upon the upper edge of each rafter, as shown in Fig. 4 of the drawings so as to compensate for expansion and contraction.

Having thus described the invention, what is claimed as new is:

1. A roofing tile comprising a cementitious body, reinforcing elements embedded transversely therein near the ends thereof, and wires embedded in the body and having their middle portions intertwisted and disposed longitudinally of the body with their end portions diverging from and free of said transverse reinforcing elements and projecting through and beyond the under face of the body near the corners of the same.

2. A cementitious roofing tile provided at

its lateral edges with rafter engaging supporting flanges, and reinforcing wires having their intermediate portions intertwisted and embedded in the tile and extending substantially at the longitudinal middle thereof, the end portions of the wires extending through and beyond the under face of the tile adjacent the corners thereof, and reinforcing elements also embedded in the tile and extending between the under face of the tile and the end portions of the first-mentioned wires.

3. A cementitious roofing tile provided at its lateral edges with rafter engaging supporting flanges, a wire embedded in the tile and having an end portion led downwardly and through the under face of the tile, and a reinforcing element also embedded in the tile and lying between the under face of the same and the embedded portion of the said wire.

4. A cementitious roofing tile provided at its lateral edges with rafter engaging supporting flanges, a wire embedded in the tile and having an end portion led downwardly and through the under face of the tile, and a corrugated reinforcing element also embedded in the tile and lying between the under face of the same and the embedded portion of the said wire.

In testimony whereof I affix my signature.

LLOYD N. BROWN. [L. S.]

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."