

No. 638,802.

Patented Dec. 12, 1899.

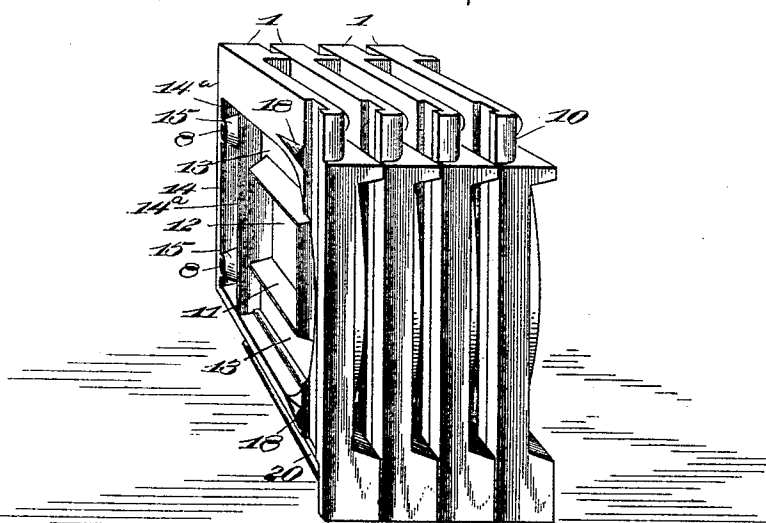
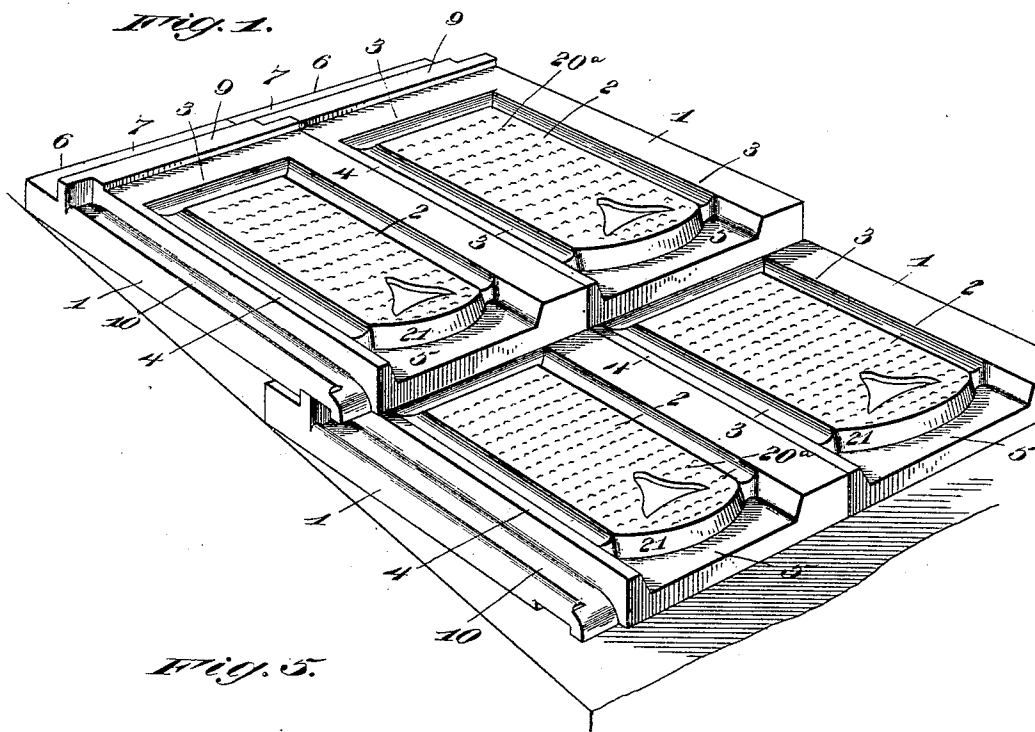
J. E. DONALDSON.

TILE.

(Application filed July 12, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

H. F. Day

H. B. Bunker

By his Attorneys.

Inventor
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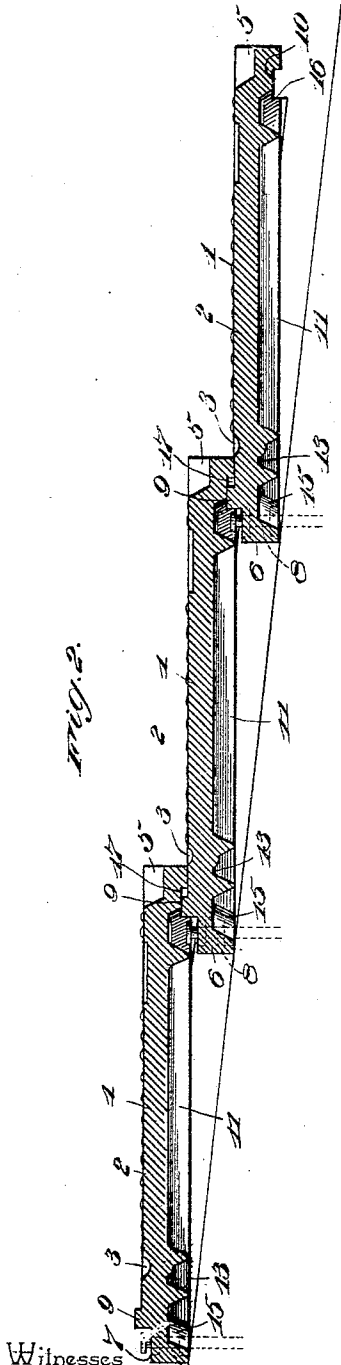
TILE.

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2 Sheets—Sheet 2.

Fig. 2.



Witnesses
Wm. F. Doyle
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Fig. 3.

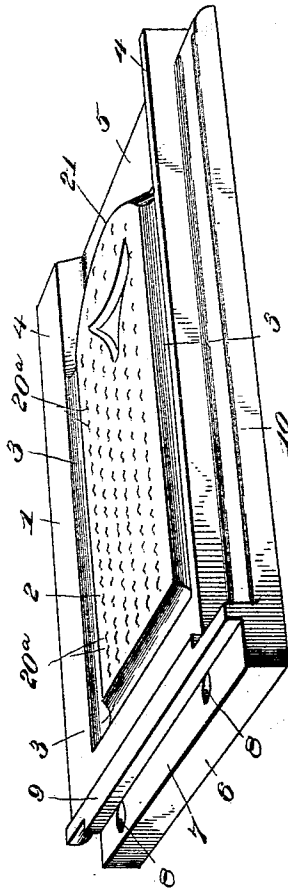
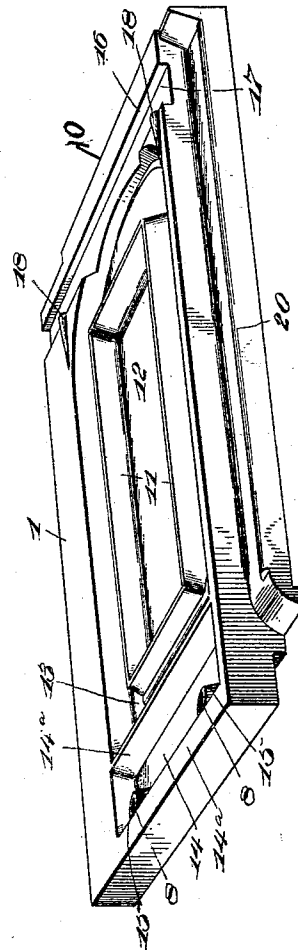


Fig. 4.



By *his* Attorneys.

Inventor
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UNITED STATES PATENT OFFICE.

JOHN E. DONALDSON, OF MONTEZUMA, INDIANA.

TILE.

SPECIFICATION forming part of Letters Patent No. 638,802, dated December 12, 1899.

Application filed July 12, 1898. Serial No. 685,770. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. DONALDSON, a citizen of the United States, residing at Montezuma, in the county of Parke and State of Indiana, have invented a new and useful Tile, of which the following is a specification.

The present improvement in roofing-tiles is designed to produce an improved article which may be safely baked or burned in a kiln without liability of unequal warpage or shrinkage of the several portions of the tile, to promote the strength of the article without involving an increase in the weight thereof, which may be fastened expeditiously and securely on the roof without the exercise of undue care to drive the nails home and into the countersinks in the tile, thereby enabling considerable time to be saved in laying the tiles in courses, and to make the article present an attractive appearance.

In the working of clay by machinery to temper it to a condition proper for fabrication into a roofing-tile it is customary to force the moving column of clay through an orifice in the machine, and practical experience has shown that the column of clay forms in laminated layers, due to the center or core of the column feeding or traveling faster than the outside thereof. These laminations of clay cause in the burning or baking of the tile unequal shrinkage or warpage of the article, as it is found that one end thereof is convex and the opposite end concaved, in consequence of which tiles cannot be laid smoothly and uniformly in courses on a roof. To overcome this difficulty, I form each tile on its upper face with a transverse rib the face of which lies on a higher plane than the face of the tile and its panel, and on the under surface of said tile, near its lower end, are formed projecting lugs, so that when the tiles are stacked in a kiln edgewise, one alongside of the other, the rib and lugs on adjacent tiles abut against said tiles to space them apart and enable the heat to circulate freely between each end and the top of the tiles, so as to burn the latter uniformly throughout their entire area. This spacing of the tiles during the burning thereof in a kiln enables them to be glazed without inconvenience while they are confined or contained in said kiln. I also

construct the upper end of the tile, on the upper face thereof, with an end flange, the upper face of which flange is on a plane below the panel and the face of the tile, while the under surface of the tile is formed with a groove, the bottom of which groove is on a plane below the under surface of the tile, whereby the tiles when laid in courses are adapted to have the ends engaged in a manner to leave a space between them into which the nail-heads may project without interfering with the proper interlocking engagement of the ends of the tiles.

In the manufacture of my tile I employ a die the working face of which is formed with a series of pockets or depressions that produce air-spaces, and when the die acts on a layer of clay these air-spaces cushion the stroke or movement of the die and produce a plurality of closely-grouped individual small projections arranged in series both transversely and longitudinally on the exposed face on the solid panel of the tile, the effect of which is to prevent the die from adhering to the clay during the operation of stamping the embryo tile from the plastic-clay layer and producing projections which add to the strength of the tile.

In my improved tile the upper face thereof is formed with a solid panel having a convex lower edge adjacent to the open lower end of the tile, while on its under surface, at the upper end, the said tile has an intaglio panel that extends transversely across said under surface. This peculiar formation of the tile overcomes the concaved and convex shrinkage at the ends of the tile in the operation of burning the same, and the upper face of each tile when laid in courses presents the appearance of two courses of tile by reason of the exposure of the squared lower edge and the convex edge of the panel on the tile.

To enable others to understand the invention, I have illustrated the same in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective view of a series of tiles laid in courses to present the appearance as when laid on a roof. Fig. 2 is a sectional view taken longitudinally through a series of

three tiles. Fig. 3 is a detail perspective view, on an enlarged scale, of one of the tiles, showing its upper face. Fig. 4 is a detail perspective view of the tile in its inverted position to show the formation of its lower surface thereof. Fig. 5 is a perspective view illustrating the method of stacking the tiles in a kiln preparatory to burning or baking the same.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

1 designates the tile in its entirety, which, as in prior patents heretofore granted to me, is made in a single piece of clay baked or burned to the proper degree of hardness. On its upper face the tile is formed with a solid panel 2, which is surrounded, except at the lower edge of the tile, by the grooves or channels 3, which in turn are bounded by the longitudinal ribs 4. In this upper face of the tile, at the lower edge thereof, is a transverse recess 5, which is on a plane below the face of the tile and the panel 2 thereof and which exposes the lower convex edge of said panel 2. At the upper end of the tile the flange or edge 6 is formed to have its face 7 on a plane below the plane of the exposed side or face of the tile and the panel 2 thereof, and in this flange or edge 6 is produced two or more apertures 8 for the reception of the nails or other devices by which the tile is fastened securely to a roof. A rib 9 is formed on the tile near its upper end to project beyond the face of the tile and its panel and the face 7 of the upper edge or flange 6 of said tile. This projecting rib 9 extends transversely across the channel, and it lies between the end or flange 6 and the transverse length of the grooves or channels 3, which bounds the central panel 2. As is usual in devices of this character a locking-flange 10 is formed longitudinally at one side edge of the tile, and this flange lies below the face of the tile, its panel 2, and the end or flange 6.

The under surface of the tile is peculiarly formed, as represented by Fig. 4—that is to say, said under surface is countersunk. On said surface of the tile is formed a continuous rib 11, that produces a central intaglio panel 12 within a recess 13. A transverse intaglio panel 14 is formed between the ribs 14^a, and within said panel 14 are provided bosses 15, through which bosses extend the nail-holes 8 of the tile. Said under surface of the tile is, furthermore, formed near its lower edge with a transverse groove 16, the bottom 17 of which groove is on a plane above the plane of the under surface of the tile. This under surface of the tile is also provided with the projecting lugs 18, which are formed adjacent to the transverse groove 16 and which lugs protrude beyond the under surface of said tile, so as to terminate in abrupt shoulders at one edge of the groove 16. Said under surface of the tile is, furthermore, provided with a locking-

flange 20, which is disposed longitudinally of the tile on the opposite side thereof from the locking-flange 10.

In the manufacture of my tile I employ a die which has its working face formed with a plurality of depressions or pockets, and when this die is depressed upon a layer of plastic clay the pockets therein contain air that forms a cushion for the die in its downward movement. This cushioning of the die prevents the adhesion of the plastic clay to its working face and produces a series of projections 20^a on the face of the solid panel 2, these projections constituting a pebbling, which adds to the strength of the tile without increasing the weight thereof. These projections are arranged in series both longitudinally and transversely of the panel, and said projections extend individually from the surface of the panel and are grouped closely together thereon, as will be evident by an inspection of the drawings. The recess 5 in the upper face at the lower end of the tile opens through the squared lower edge of the article, and the lower edge of the panel 2 is made convex, as at 21, so as to be exposed through the recess 5.

In applying the tiles in courses to a roof the nails are driven through the holes 8 in the flange 6 and bosses 15 at the upper end of the tile; but as the face 7 of said end or flange 6 is on a plane below the exposed face of the tile it is not necessary to drive the nails home and into the countersinks around the openings 8 of the tile. The next tile is fitted to the one previously applied by having the rib or flange 9 fit into the transverse channel or groove 16 of the upper tile, and as the bottom 17 of this channel or groove 16 is on a plane above the under surface of the upper tile and as the rib 9 fits into said channel or groove 16 in contact with the bottom 17 thereof the lower end of the upper tile is maintained in a position on the lower tile, so as to be free from contact with the face 7 of the end or flange 6 of the first tile applied to the roof. This relative arrangement of the two tiles provides a space between the opposing faces of the tiles at the interlocked ends thereof, as clearly shown by Fig. 2 of the drawings, and into this space may project the heads of the nails which fasten the tiles to the roof. It will be evident that it is not necessary to drive the nails into the tiles to lie flush with the face 7 at the upper end or flange 6, and the operator is thus enabled to fasten the tiles in place quickly without involving breakage of the tiles, thereby effecting a material saving in time. As is usual the tiles are laid side by side to have the flange 10 at one edge interlock with the flange 19 on the edge of the adjacent tile. By laying the tile in courses to have the lower end of one tile overlap the upper end of the tile laid in course below the same the squared lower edge of the tile and the convex edge 21 of the solid panel 2 are all exposed to view, thus making each course of tiles present the

appearance of two courses, which is due to the exposure of the squared lower edge of the tiles and the convex edges of the panels 2 thereof.

5 In the practical manufacture of the tiles I have demonstrated that the exposure of the convex edge 21 of the solid panel on the upper face of the tile and the employment of the transverse intaglio panel 14 on the under
10 surface and at the upper end of the tile effectually overcomes that tendency of the ends of the article to become warped or shrunk in convex and concave form due to the lamination of the clay and the burning or baking of
15 the tile in the kiln.

By reference to Fig. 3 it will be noted that the fire-clay tile is provided on its upper face and at the lower end thereof with a recessed or cut-away portion, which lies below the
20 plane of the shallow groove 3 and into which recess projects the lower convex end of the solid panel 2, said convex end of the panel being of greater thickness or depth than the sides or opposite end of the panel surrounded
25 by the shallow groove. This extension of the convex thickened end of the raised panel into the recessed end portion of the tile insures the free circulation of heat around the thickened end of the panel, because the heat can
30 obtain free access to the panel, the thickness and convexity of which overcome warpage and shrinkage of the tile during the operation of baking the same.

After the tiles have been stamped and dried
35 they are placed on edge and stacked together in close relation in the manner represented by Fig. 5. In stacking the tiles the rib 9 on the exposed face of one tile contacts with the under face of the adjacent tile near the ends
40 thereof, while the projecting lugs 18 on the under face of each tile come in contact with the outer face of the tile adjacent thereto at the opposite ends of the said tiles. This arrangement of the rib 9 and the lugs 18 insures the spacing of the adjacent tiles to a
45 sufficient extent to secure a free circulation of the heat between the ends and the central portions of the tiles, and the heat is thus caused to circulate so as to have contact with
50 all portions of the tiles, so as to burn or bake the same uniformly and subject the central portion of the outer face of the tile to the action of the heat to the same extent as the end portions or the under faces of the tiles.
55 Tiles constructed in accordance with my invention may be manufactured and sold in successful competition with a good quality of wooden shingle, and they can be placed on the market equal to if not superior than any tile
60 heretofore produced.

Changes may be made in the form of some of the parts, while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited
65 to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what I claim is—

1. A roofing-tile provided on its upper face, at one end, with a transverse rib and with an
70 end flange, the face of which is in a plane below the upper face of the tile, and further provided, on its under surface and at the opposite end, with a transverse groove and with projecting lugs which terminate at one edge
75 of the groove; said grooved end of one tile adapted to overlap the end flange and rib of an adjacent tile for the projecting lugs to abut against the rib and permit the nail-heads
80 of the lower tile to protrude into the groove of the overlapping tile, substantially as described.

2. A roofing-tile provided on its upper face with a solid panel, the transverse rib, and an
85 end flange, the face of which flange is below the plane of the panel; and also provided, on its under surface, with a transverse groove, a central intaglio panel, and a transverse intaglio panel at the end opposite to the rib and
90 flange on the upper face; and the bosses located in the transverse intaglio panel and provided with openings that extend through the end flange, substantially as described.

3. A roofing-tile provided on its under surface with a transverse intaglio panel at one
95 end, a transverse groove at the other end, and the continuous rib, 11, within the tile edges and between the panel and groove, forming a central intaglio panel, 12; said tile also provided, on its upper face with a solid panel,
100 an end flange, and a transverse rib between said flange and panel, substantially as described.

4. A fire-clay roofing-tile provided, on its upper surface, with a raised panel, and with
105 a shallow groove surrounding both sides and one end of said panel, the other lower end of said panel being of convex form and of greater depth or thickness than the sides or end which are bounded by said shallow groove, said
110 lower end of the tile having a cut-away portion lying below the shallow groove and into which extends the lower thickened end of the panel, substantially as described.

5. A fire-clay roofing-tile provided within
115 its lower sunken surface with a raised continuous rib, 11, forming a longitudinal intaglio panel, 12, a transverse intaglio panel near one end, a transverse groove near the other end, and the projecting lugs, 18, terminating at
120 one end of said transverse groove, substantially as described.

6. A fire-clay roofing-tile provided, on its upper surface, with a raised panel and with a series of closely-grouped, individual, small
125 projections arranged in series both longitudinally and transversely of the panel and constituting a pebbling on the exposed face of the tile, for the purpose described, substantially as set forth.

7. A fire-clay roofing-tile provided on its upper surface with a raised panel having a
130

convex lower end of greater depth or thickness than at its side edges, a cut-away portion at the lower end of said tile and into which said thickened convex edge of the panel projects, and closely-grouped, individual projections arranged in series both longitudinally and transversely on the exposed face of said panel, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN E. DONALDSON.

Witnesses:

HORACE B. GRIFFITH,
THOMAS I. WILLIAMSON.