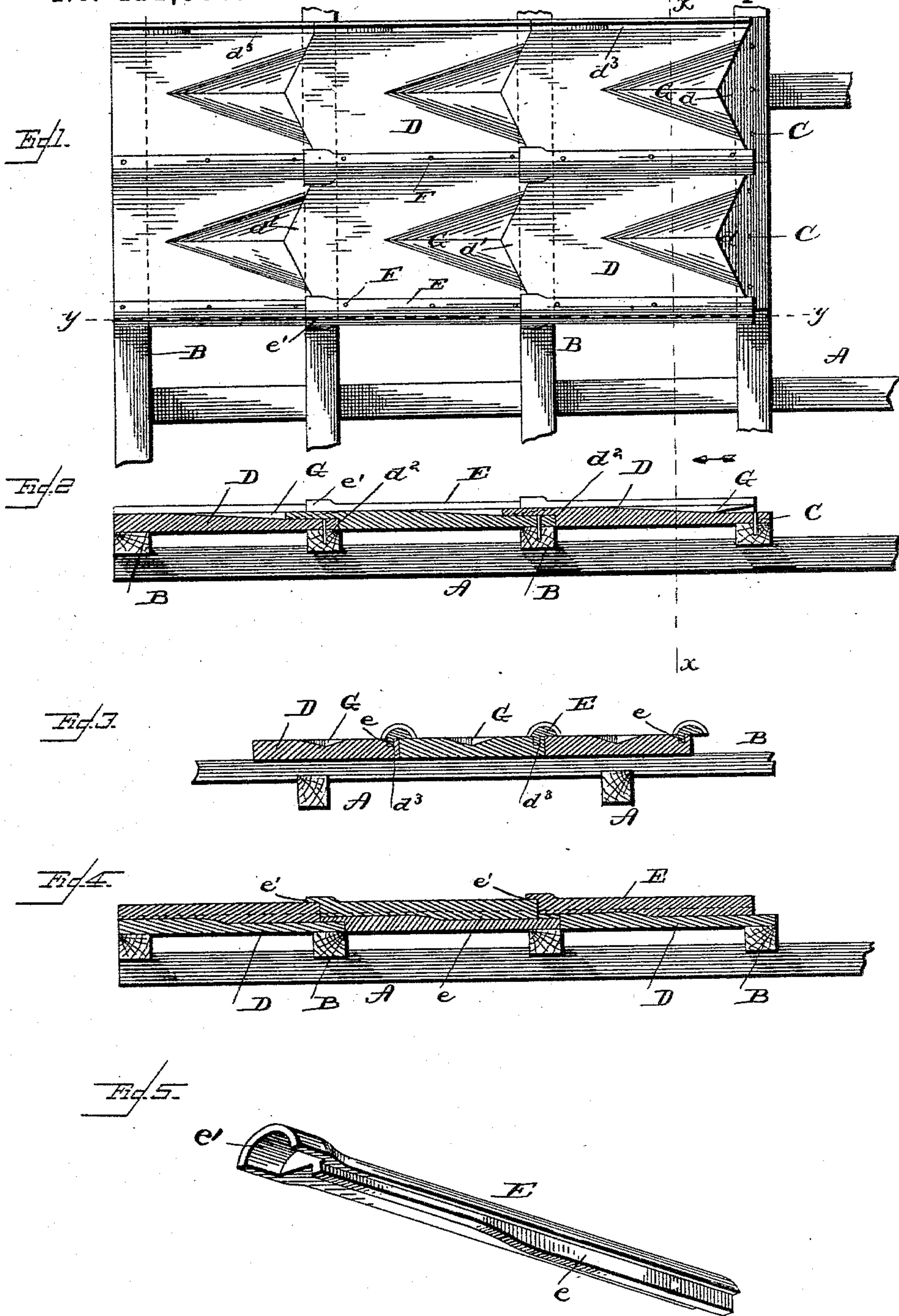


(No Model.)

R. LIDDELL.  
ROOFING TILE.

No. 411,666.

Patented Sept. 24, 1889.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

ROBERT LIDDELL, OF BLAKEMAN, KANSAS.

## ROOFING-TILE.

SPECIFICATION forming part of Letters Patent No. 411,666, dated September 24, 1889.

Application filed April 16, 1889. Serial No. 307,411. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT LIDDELL, a citizen of the United States, and a resident of Blakeman, in the county of Rawlins and State of Kansas, have invented certain new and useful Improvements in Roofing-Tiles; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to  
10 which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a top plan view of a roof provided with my improved tiling. Fig. 2 is a longitudinal sectional view. Fig. 3 is a cross-sectional view on the line  $x x$ , Fig. 1. Fig. 4 is a longitudinal section through line  $y y$ , Fig. 1; and Fig. 5 is a detail view of the retaining-strip.  
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Like letters of reference denote like parts throughout the several views.

My invention has relation to improvements in roofing-tiles; and it consists in the improved construction and combination of parts, as hereinafter more fully pointed out and described, whereby when laid to form a roof they may be locked and jointed together on all sides. Further, in so constructing the exterior surface of the tiles as to form an effective means for shedding the rain or moisture and preventing it from penetrating the roof and causing rotting of the rafters and stringers or other deleterious effects thereto; and,  
30 furthermore, in various other details of construction, as hereinafter more fully described.

Referring to the drawings, the letter A indicates the rafters, and B the stringers or supporting-strips. Secured to these stringers or supporting-strips by means of bolts C or equivalents are my improved tiles, designated by the letter D, said tiles being provided at their upper ends with a V-shaped depression or recess  $d$ , and at their lower end with a correspondingly-shaped projection  $d'$ , being provided on its under side with a shoulder or offset  $d^2$ . Each tile is also provided on its exterior surface, on one side only, with a groove  $d^3$ .  
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In carrying out my invention a series of tiles are secured to the stringers or support-

ing-strips, so that the V-shaped depression or recess will occupy the uppermost position. Above these are then likewise placed a second series of tiles in such a manner as to permit the projection  $d'$  to pass into the depression  $d$  of the lower row of tiles. In this manner it will be seen that the shoulder upon the under side of the upper tier will bear against the upper end of the lower tier, while the extended end of said upper row will register with the depression of the lower row, thereby forming a lap-joint between the two. It will also be seen that the longitudinal grooves upon the several tiers will register, thus forming a continuous groove. Above the grooves are arranged retaining-strips E, provided upon their under sides with longitudinal strips or tenons  $e$ , located to one side of the center thereof, and also provided on their lower end with a semi-cylindrical recess  $e'$ . The tenons  $e$  are adapted to fit into the grooves  $d^3$ , said tenons being located near the edge of the strip which bears on the side of the tile in which the groove is located, thereby permitting the greater portion of the width of the strip to bear upon the upper surface of the adjacent strip upon that side thereof in which the groove is not located, thus also affording ample opportunity for the insertion of bolts or equivalents F, for the purpose of securely holding said strips in place. The upper ends of these strips fit in the semi-cylindrical recess in the lower end of the retaining-strip above the same, thereby interlocking and being held firmly together. The exterior surface of these tiles are formed near the upper ends thereof, from the point of the V-shaped recess or depression, with a channel G, approximately of conoidal form, the apex thereof being located slightly below the center of the tile. By means of these channels in rainy weather the water is gathered in one stream, instead of being spread over the entire surface of the tile, until it reaches the apex of the channel, when it passes down to the next tile, where it is again gathered together in one stream, and so on until it passes to the water-spout of the roof.  
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By this construction of tile it will be seen that I am enabled to join the several tiles together in an absolutely effective way and in  
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such a manner as to render it impossible for water or moisture to enter and affect the sub-structure, the joints being so formed as to be thoroughly protected. Furthermore, my  
5 invention is simple in construction, strong, light, and durable, and fire-proof.

By reference to Fig. 4 of the drawings it will be seen that the side groove  $d^3$  of the tiles is thickened at the point where it terminates in the projection  $d'$ , while the portion  
10 of the tenons  $e$  which fits in the grooves at this point is correspondingly decreased, thus affording an even fit of said tenons within the grooves and at the same time strengthening  
15 the latter at the point where the extension projects.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

20 1. The combination, with the tiles provided on one end with a depression or recess and on their opposite end with an undercut portion to form the herein-described lap-joint between the contiguous edges of any two  
25 tiles, and being further provided on their upper side with a longitudinal groove, of the retaining-strips provided upon their under side with a longitudinal strip or tenon, substantially as set forth.

30 2. The combination, with the tiles provided on one end with a depression or recess and on their opposite end with an undercut portion to form the herein-described lap-joint between the contiguous edges of any two tiles,  
35 and being further provided on their upper side with a longitudinal groove, of the retaining-strips provided on their under side with a longitudinal strip or tenon having one end provided with a semi-cylindrical recess,  
40 substantially as set forth.

3. The combination, with the tiles provided on one end with a depression or recess and on their opposite end with an undercut portion to form the herein-described lap-joint be-  
45 tween the contiguous edges of any two tiles, and being further provided on their side with a longitudinal groove, of the retaining-strips provided on their under side with a

longitudinal strip or tenon located to one side of the center thereof, substantially as set  
50 forth.

4. The combination, with the rafters and stringers, of tiles resting on said stringers, said tiles being provided on one end with a depression or recess and on their opposite end  
55 with an under-cut to form the herein-described lap-joint between the contiguous edges of any two tiles, and being further provided on their upper side with a longitudinal groove and also a channel, of the retaining-strips pro-  
60 vided on their under side with longitudinal strips or tenons, and having one end provided with a semi-cylindrical recess, substantially as set forth.

5. The combination, with the tiles provided  
65 on their upper side with a longitudinal groove, said groove being contracted in depth at one end, of the retaining-strip provided with a longitudinal tenon fitting in said groove, the end thereof which registers with the dimin-  
70 ished or contracted portion of the groove being correspondingly decreased in width to perfect a neat joint, substantially as set forth.

6. The combination, with the tiles provided  
75 on one end with a depression or recess, and on their opposite end with an undercut portion to form the herein-described lap-joint between the contiguous edges of any two tiles, and being further provided on their upper  
80 side with a longitudinal groove, said groove diminishing in depth at that end of the tile which is provided with the undercut portion, of the retaining-strips provided with a longi-  
85 tudinal tenon fitting in said groove, the portion of the tenon which registers with the reduced portion of the groove being decreased, so as to afford a perfect joint therewith, substantially as set forth.

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

ROBERT LIDDELL.

Witnesses:

T. W. COCHRAN,  
W. B. KEENRIGHT.