

(No Model.)

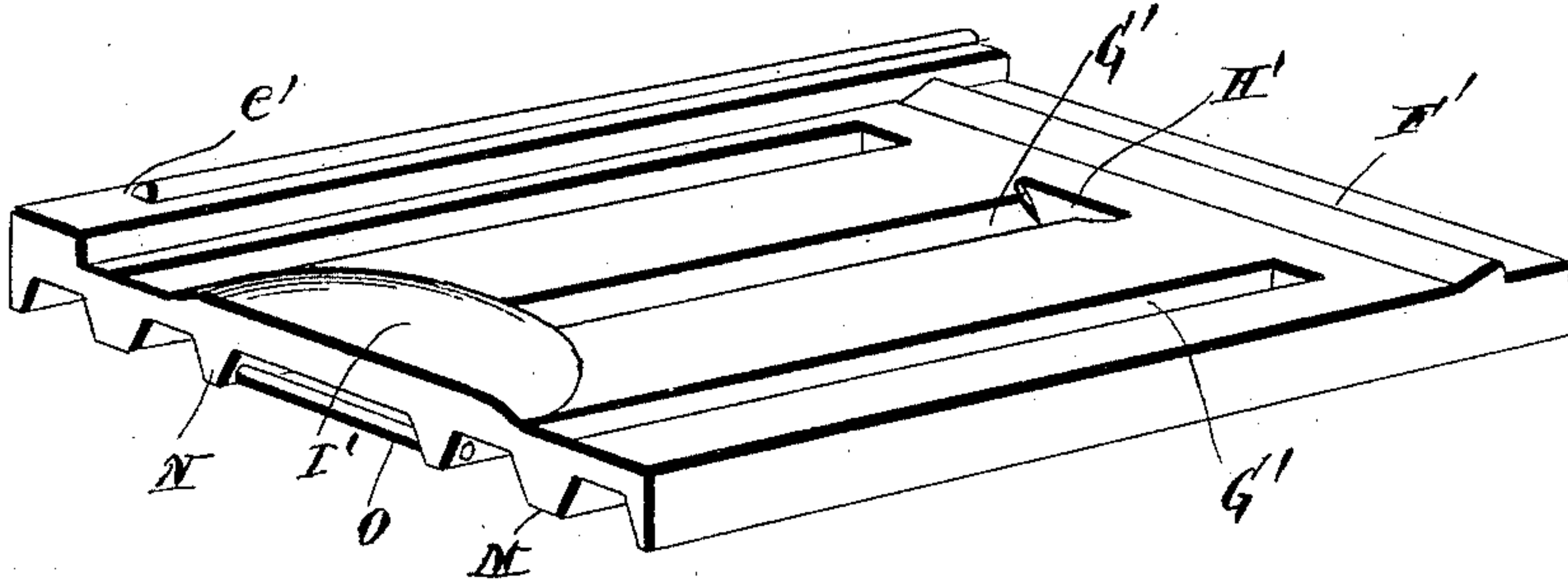
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J. E. DONALDSON.  
DIE FOR FORMING ROOFING TILES.

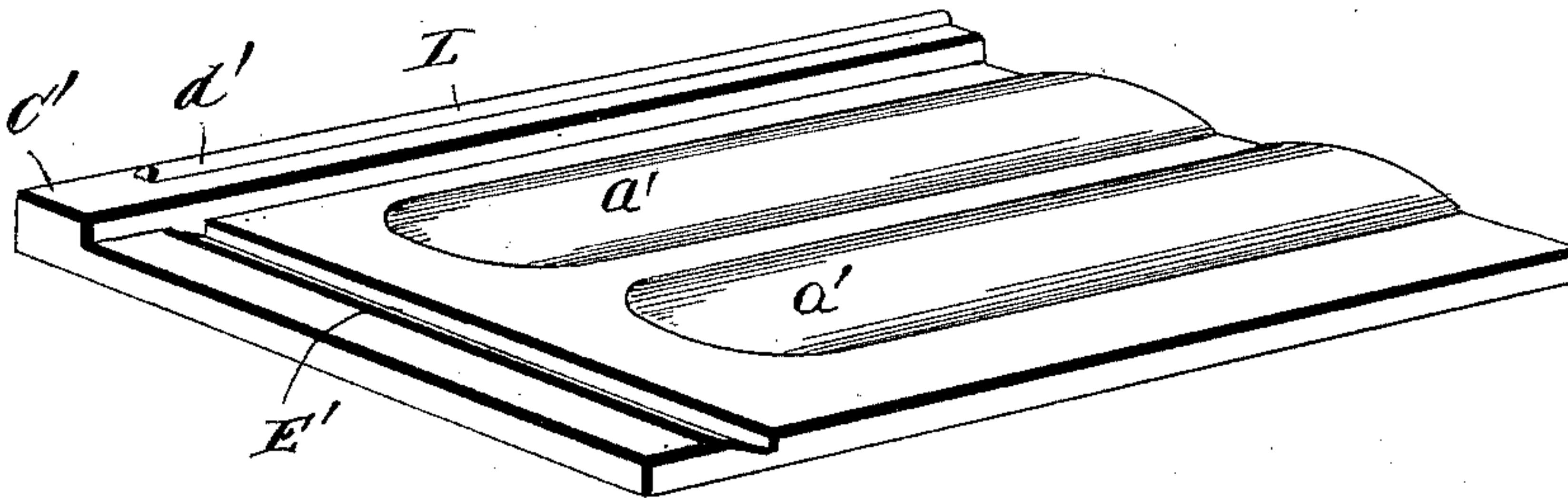
No. 432,122.

Patented July 15, 1890.

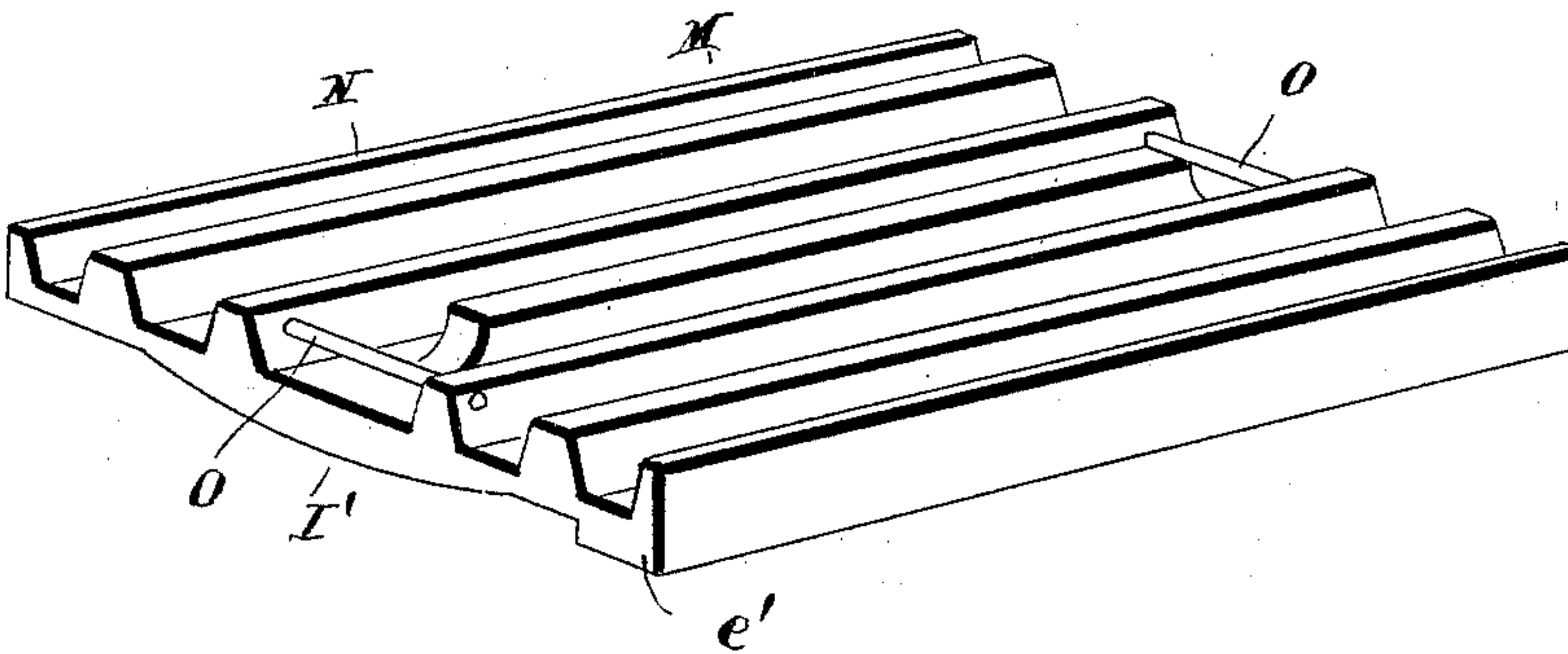
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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Inventor  
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By his Attorneys  
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(No Model.)

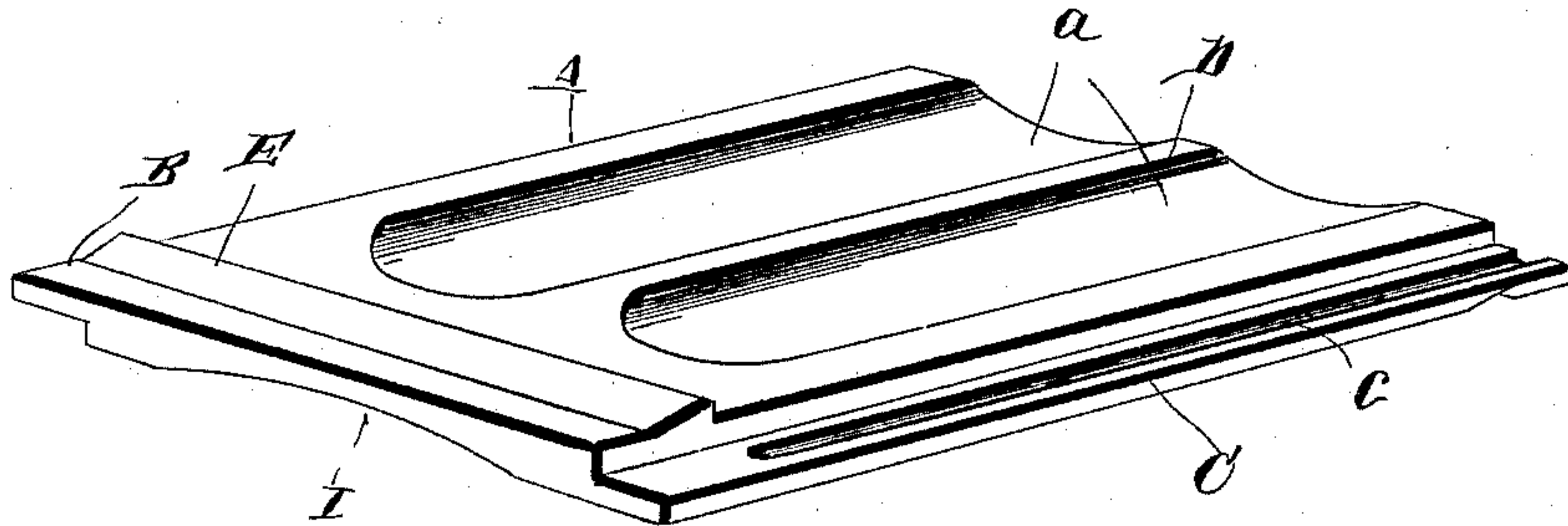
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J. E. DONALDSON.  
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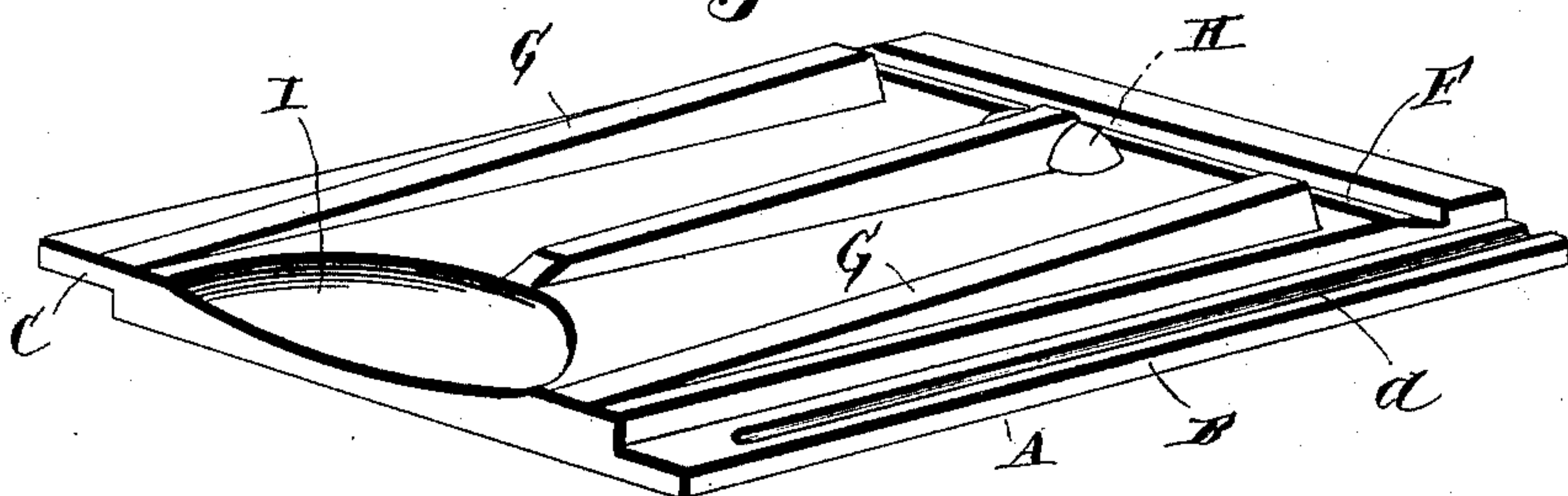
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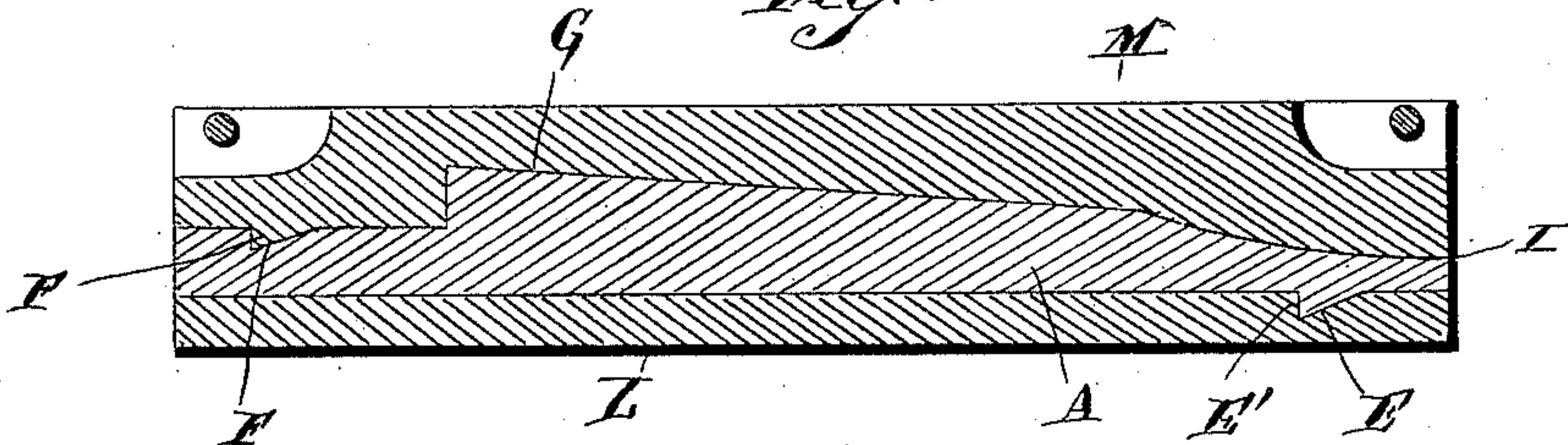
*Fig. 4.*



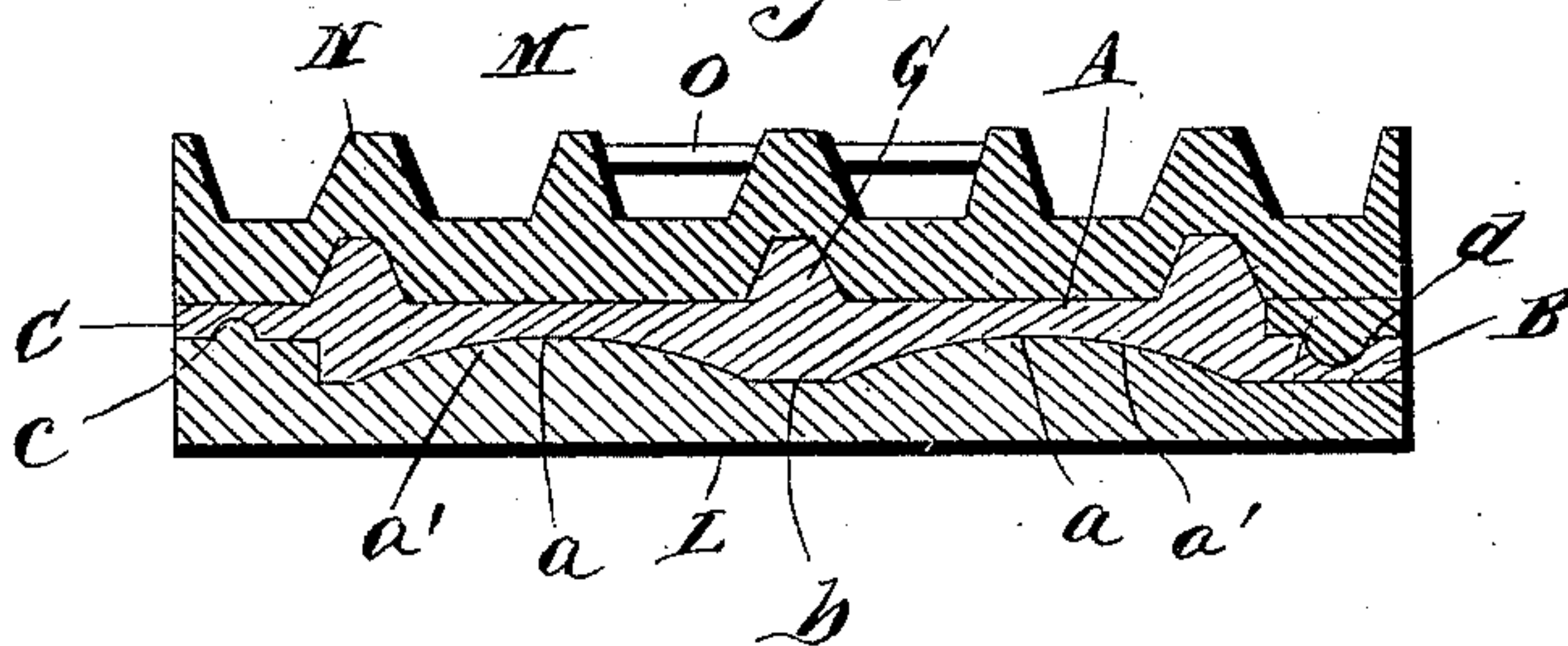
*Fig. 5.*



*Fig. 6.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

JOHN E. DONALDSON, OF MONTEZUMA, INDIANA.

## DIE FOR FORMING ROOFING-TILES.

SPECIFICATION forming part of Letters Patent No. 432,122, dated July 15, 1890.

Application filed June 30, 1888. Serial No. 278,707. (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 Improvement in Dies for Forming Tiles, of which the following is a specification.

My invention relates to an improvement in and dies for forming roofing-tiles; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view, looking from the upper side of the lower die for forming tile. Fig. 2 is a similar view from the under side of the upper die. Fig. 3 is a perspective view, looking from the lower side of the lower die. Fig. 4 is a perspective view of a tile made in my improved die, looking from the upper side. Fig. 5 is a similar view of the under side of my improved tile. Fig. 6 is a longitudinal sectional view of my improved dies, showing the same in the act of forming a tile between them, showing the same in an inverted position. Fig. 7 is a transverse sectional view of the same.

A represents a roofing-tile, which is preferably made of fire-clay, but may be made of other suitable material. The upper surface of the roofing-tile is provided with two or more longitudinal channels or grooves *a*, which are parallel with each other and separated by an intervening ridge *b*, whereby when the tile is laid on a roof, the roofing-tiles of similar construction adjacent thereto, the grooves of the upper row of tiles align with those of the next lower row of tiles and thus form grooves which are practically continuous from the ridge to the lower edge of the roof, so that water is rapidly carried off from the same.

The tile is provided at one of its side edges and in its upper side with an extension or flange *B*, in the under side of which is formed the longitudinal groove *d*, which is semi-cylindrical in transverse section, is open at its lower end, and has its upper end extending to within a slight distance of the upper edge of the tile. The opposite side edge of the roof-

ing-tile is provided with a similar flange *C*, which, however, projects from the lower side of the tile. These extensions or flanges *B* *C* form a lap or rabbet joint when the tiles are placed together, and the flange or extension *C* is provided in its upper side with a longitudinal groove *e*, which is similar to the groove in the flange *B* and registers with the same when the tiles are arranged side by side, the function of these grooves being to form a channel in the lap-joint of the tiles for the purpose of carrying off water which enters the joint and preventing the same from leaking through the roof. The said channel also serves to admit air to hasten the drying of the tiles after a rain, and also to permit the free escape of the water from between the lap-joints of the tile.

The tile is provided on its upper side at a suitable distance from its upper edge with a transverse rib or flange *E*. The lower side of this rib or flange is at right angles to the face of the tile, and the upper side thereof is beveled or inclined, as shown.

On the under side of the tile near its lower edge is a groove or recess *F*, which extends transversely across the tile and is similar in shape to the rib or flange *E*, and is thereby adapted to match the said rib or flange of the subjacent tile, so as to effect a tight joint between each lower and the next adjacent upper tier of tiles, the transverse ribs *E* serving to prevent fine particles of snow or sleet from being blown between the tiles. The lower side of the tile is further provided with longitudinal ribs *G*, which are parallel with each other and equidistant apart, the said ribs being tapered longitudinally and having their lower sides inclined downwardly, as shown, and thereby adapted to support the tile at a suitable angle on the roof, the depth of the lower ends of the ribs *G* being equal to the depth of the enlarged end of the subjacent tile, so that the lower edges of the ribs *G* will bear firmly and squarely against the sheeting *W*.

When the tiles are laid on the roof they are arranged so that each tier in succession breaks joints with the lower tier, and in order to prevent fine particles of snow or sleet from being blown into the joints between the tiles,



I provide the central rib G at its lower end with a transverse head H, which projects a suitable distance from both sides of the rib and has its upper corners rounded, as shown.

5 The lower side of this head H extends across the upper end of the joint between the adjacent tiles in the lower tier, so as to effectually prevent particles of snow or sleet from being blown between the tiles, as before stated.

10 In the under side of the tile at the upper end thereof is a semicircular concavity or recess I, which is formed by the die in the process of manufacturing the tile for the purpose to be hereinafter stated.

15 L represents the upper die, which is used in pressing the tile in shape, and is provided at one edge with a flange C', having a raised rib d', adapted to form the groove d and the flange C of the tile, and the said upper die has at its

20 upper end a transverse countersunk groove E', adapted to form the rib E of the tile, and is provided with a pair of parallel convex offsets a', which are adapted to form the channels a in the tile.

25 The lower die M has at one end a transverse flange F', which is adapted to form the groove F in the tile, and is provided at one side with a flange B', having a raised bead or rib e', adapted to form the groove in the flange B.

30 In the face of the lower die are parallel grooves G', which form the matrices for the ribs G, and the central groove G' has at one end a countersunk transverse recess H', adapted to the contour of the head H of the

35 tile. At the opposite end of the lower die the same is provided with a semicircular offset I', which is adapted to form the recess I in the tile, and in so doing press the plastic material into the grooves G' by displacing some of the

40 plastic material, and thereby causing the ribs G to be clearly and sharply defined. On the lower side of the lower die are a series of parallel depending supporting-ribs N, which are equidistant apart, each alternate rib being

45 wider than the adjacent rib on opposite sides thereof, as shown. The central rib N has its ends cut away, and the ribs which are adjacent to the said central ribs have their lower corners connected by transverse rods O, which

50 form handles, by means of which the die may

be lifted when reversed, so as to remove the molded tile therefrom.

The operation of my invention is as follows: The lower die is inclosed in a suitable flask and arranged on the bed of a press such as 55 are commonly employed for molding plastic materials, and the upper die is secured to the follower of the press and caused to register with the lower die. A sheet of fire-clay of suitable size and in a plastic condition is placed 60 on the lower die. The press is operated so as to cause its follower to force the upper die downward in the flask, and thereby subject the sheet of clay to pressure and cause the same to be molded into a tile, as will be readily understood. The follower is then raised 65 so as to remove the upper die, the flask is opened, the lower die containing the molded tile is removed from the press to a suitable table or rack on which the tile is to be dried, 70 and the said lower die is then reversed and turned bottom upward so as to cause the molded tile to be disengaged therefrom.

Having thus described my invention, I claim— 75

1. The die M, having the series of grooves G', and the offset I', for the purpose set forth, substantially as described.

2. The lower die having the ribs N on its lower side, the central rib having its ends cut 80 away, and the transverse rods O, connecting the lower corners of the same, substantially as described.

3. The lower die M, having the series of grooves G', the central one of which has the 85 recess H', as set forth.

4. The lower die M, having the series of grooves G', the offset I', the transverse rib F', and the flange B', formed to co-operate with the upper die having the transverse groove 90 E', the side flange C', and the longitudinal convex offsets a', substantially as described.

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

JOHN E. DONALDSON.

Witnesses:

MINER T. DAVIS,

SEPTIMUS VANLANDINGHAM.