

(No Model.)

P. H. JACKSON.  
LENS FOR ILLUMINATING TILES.

No. 446,350.

Patented Feb. 10, 1891.

FIG. 1.

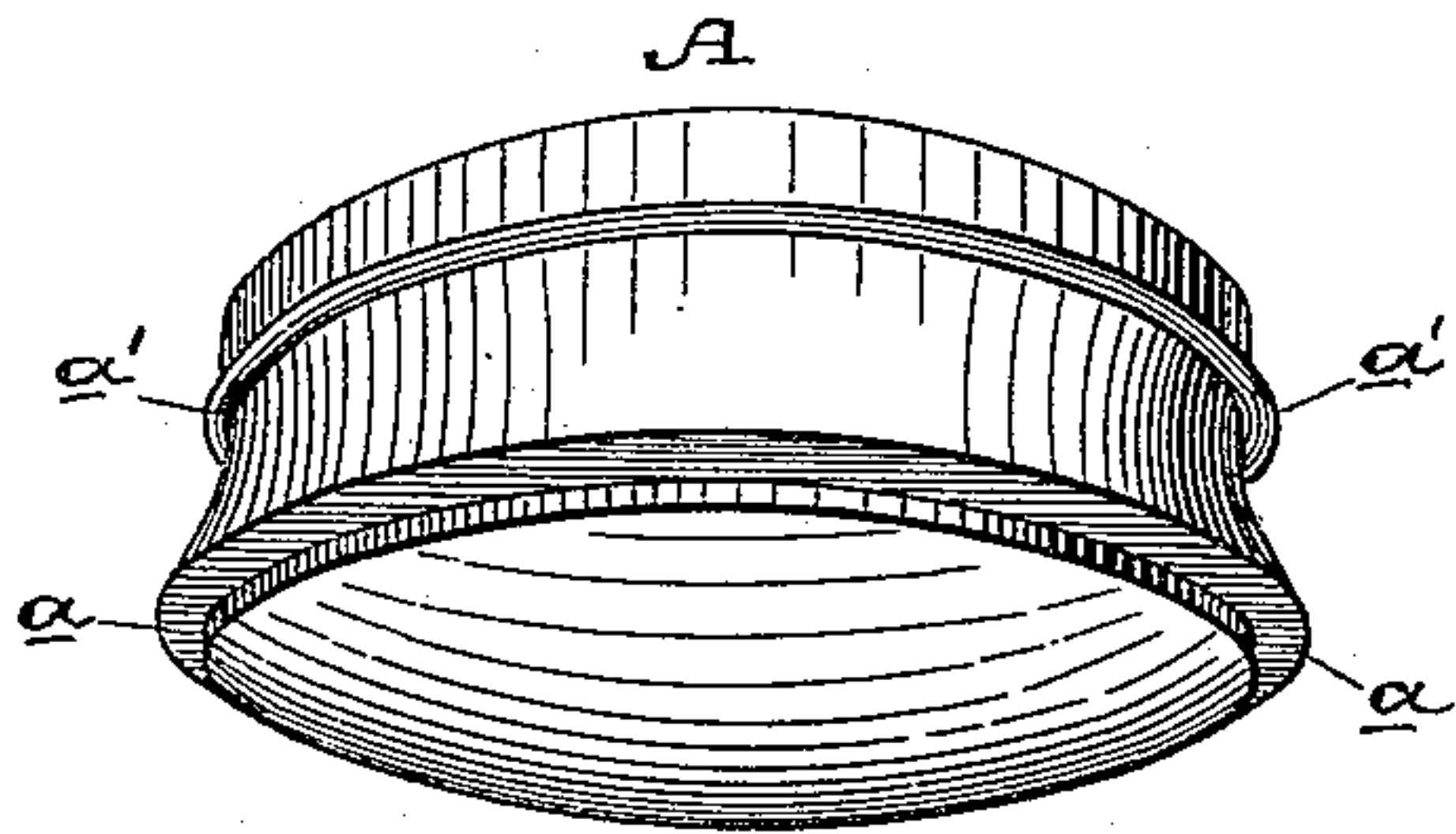


FIG. 2.

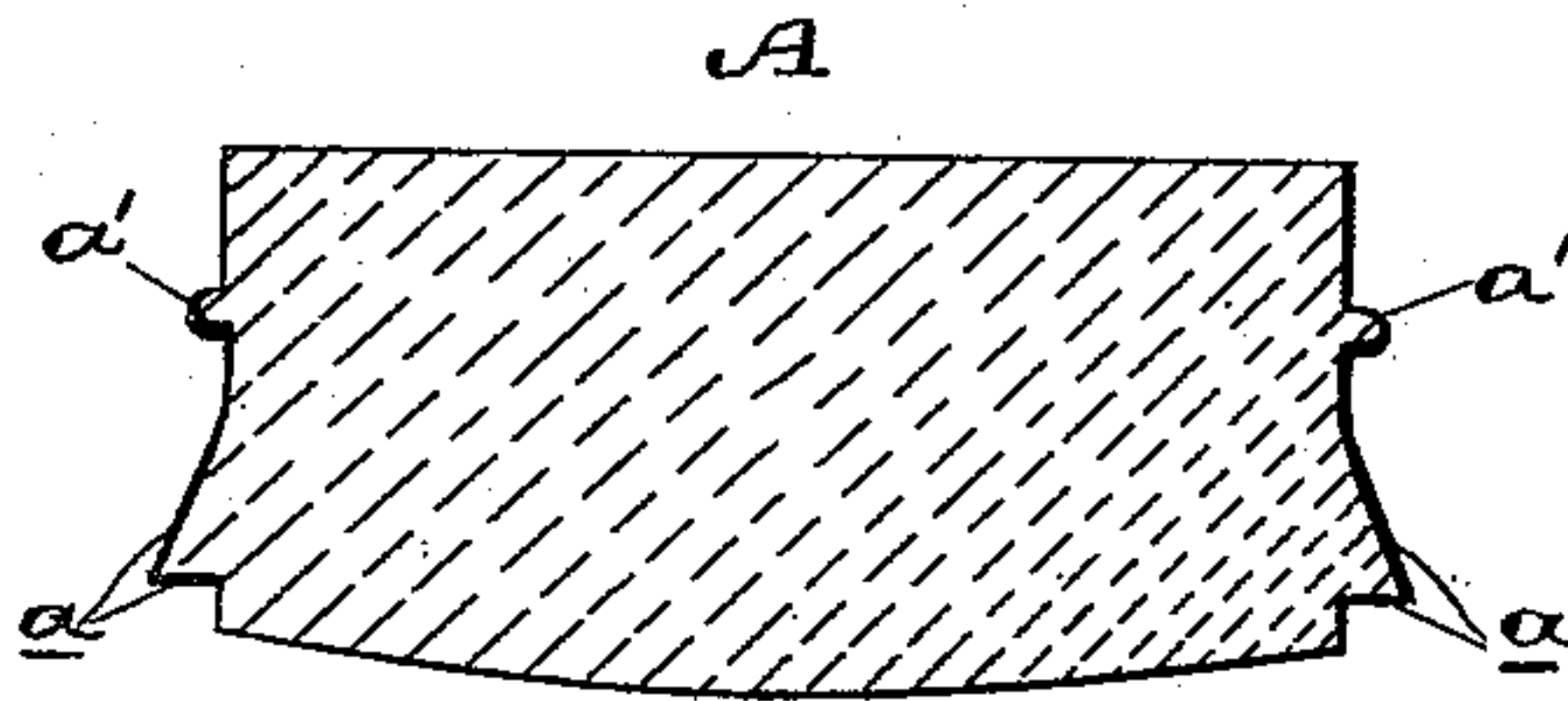
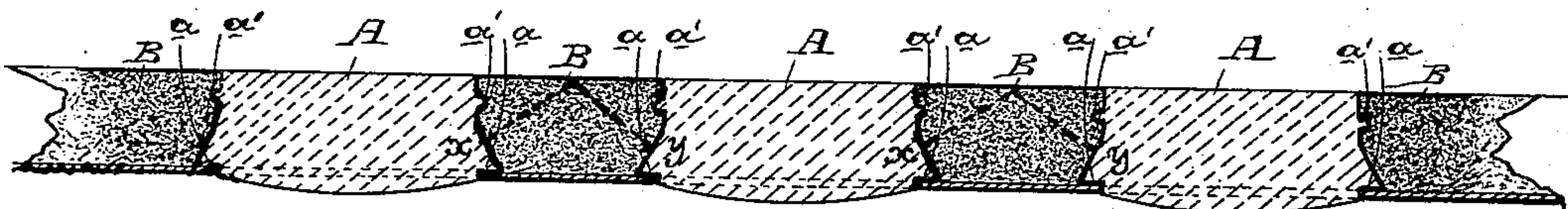


FIG. 3.



Witnesses,  
J. H. House  
H. C. Lee.

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By Devereux Co. atty



# UNITED STATES PATENT OFFICE.

PETER H. JACKSON, OF SAN FRANCISCO, CALIFORNIA.

## LENS FOR ILLUMINATING-TILES.

SPECIFICATION forming part of Letters Patent No. 446,350, dated February 10, 1891.

Application filed October 27, 1890. Serial No. 369,516. (No model.)

*To all whom it may concern:*

Be it known that I, PETER H. JACKSON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Lenses for Illuminating-Tiles; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of lenses to be used in cement, concrete, or other plastic material when applied to illuminating-tiles for sidewalks, floors, roofs, and the like for lighting apartments beneath.

My invention consists in the novel lens, and in said lens in connection with the surrounding material in which it is embedded, all of which will be hereinafter fully described, and specifically pointed out in the claim.

The objects of my invention will appear in the course of the following description.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view of my lens. Fig. 2 is a vertical section of same. Fig. 3 is a vertical section showing several of my lenses in connection with the surrounding plastic material forming the equivalent of a flat arch.

The lens A is made of glass, and is preferably so formed that its bottom surface for the effusion of the rays of light will be equal, or nearly so, in area with the top surface which receives the rays, so that the exit of light will be equal to the influx. Beyond or outside of the light-bearing part or area of the lens, around its periphery at the bottom thereof, is an extension *a* of the smallest quantity of glass consistent with strength for the purpose. The bottom of this extension is flat and forms the bearing upon which it depends for support upon the iron or concrete foundation or base of the tile-frame, as shown in Fig. 3. This extension is of a frustuminal character, having its greatest diameter at its base, and it gradually tapers upwardly until it merges into the general circumference of the lens. This small quantity of material in this extension is equivalent for strength to the tapering projection beyond the shaft of the footing of a brick or stone pier used for the support of buildings and bridges. The first advantage of this frustuminal extension *a* is that it provides a support for the lens

outside of the light area, so that none of the light is obstructed, and this support is at its bottom directly upon the proper base or foundation of the tile-frame. In gaining the support economy in the use of material consistent with the requisite strength is had. Another advantage and function of this tapering extension *a* is that it forms a skewback for the filling material in the spaces between adjacent lenses. This filling is shown by B in Fig. 3, and consists of cement or concrete or any other plastic material which becomes hard upon setting. These spaces are of such a shape, on account of the skewback of the surrounding or adjacent lenses, that the material filled into them becomes the equivalent of a flat arch with increased strength due to that construction. Therefore the filling material has increased resistance to the passage over it of heavy bodies or when subjected to severe impact. The force of a heavy body falling upon this filling material thus shaped into flat arches by the surrounding skewbacks of the lenses is transmitted diagonally upon the sloping skewback sides in the direction of its center. In Fig. 3 I have indicated by the dotted lines *x y* the direction of this force. The lines of resistance of the flat arch are coincident to a right angle formed by a line from the skewback, the abutment of the latter being the base of the angle. Another advantage of this tapering extension on the periphery of the lens is that it serves to better retain the lenses in place during the application of the thick plastic material around and about them. In this operation the plastic material in a thick mass is roughly laid on the lenses, which rest in their respective places, either on a wooden form if a cement bottom is to be used or on an iron plate or sheet if an iron bottom is to be used. The mass is filled in between the lenses even with their top surfaces. It is then pressed down on one side at a time, and the pressure being on one side, rubbing over their surfaces with a trowel causes the side opposite to that on which the pressure is applied to lift up; but with lenses such as I have described the weight of the material on the tapering projection better retains the lens in its position in its socketed bed against the applied pressure in troweling, which ordinarily has the effect



stated of lifting up one side of the lens, this effect being the more certain on account of the socket being always a little ample to provide for fins on the lenses caused in their manufacture by the mold not closing nicely.

The ordinary work of illuminating-tiles for a large building requires the use of a very great number of lenses, and the setting of these has to be quickly done, admitting of no minute attention in detail, and the whole when completed has to be water-tight. Therefore it becomes apparent that any means which will insure the rapid setting of the lenses without danger of any of them slipping and thus causing a leak is of advantage.

In order to further subserve the object of keeping the lens in place when the thick plastic material or filling is being pressed upon the side in smoothing the surface, I have a ring  $a'$  formed on the lens above the skew-back.

It will be readily understood that the bottom of my lens may be of any suitable form for a plane lens, a refracting-lens, and other forms.

I am aware that lenses have been heretofore made with rings of different shapes about their periphery, and I do not claim such; but

What I do claim as new, and desire to secure by Letters Patent, is—

In an illuminating-tile, the lenses fitted in the tile-frame, each of said lenses having its bottom and top light-surfaces of about equal area, and a peripheral frustuminal extension around its lower portion and projecting beyond the light area of the lens, the bottom of said extension resting on a base in the tile-frame and forming a support for the lens, said lens having also formed around its upper portion above the frustuminal extension an encircling ring, and the filling-in material between the lenses, substantially as herein described.

In witness whereof I have hereunto set my hand.

PETER H. JACKSON.

Witnesses:

S. H. NOURSE,  
H. C. LEE.