PATENTED
NOV 26 1867

Frederick Fitzgerald

71475

Vault. store and deck Light.

Fig. 1.

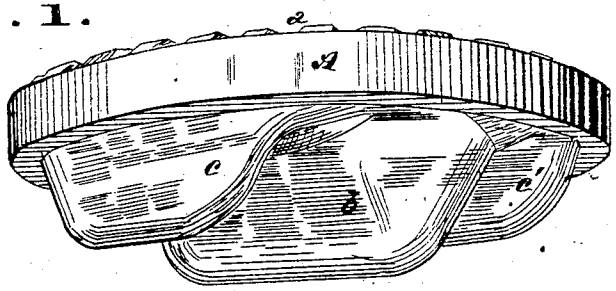
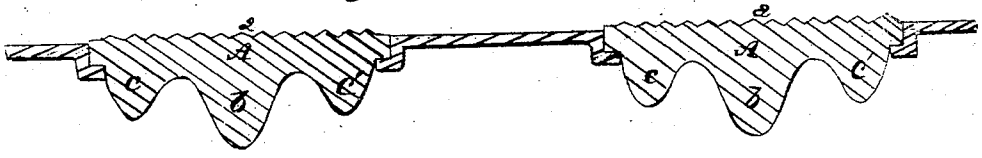


Fig. 2.



Attest,
Frank Millward
Fred Bachrens

Inventor.
F. Fitzgerald
By Knight Bros
Attys

United States Patent Office.

FREDERICK FITZGERALD, OF CINCINNATI, OHIO.

Letters Patent No. 71,475, *dated November* 26, 1867.

IMPROVED VAULT-LIGHT.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, FREDERICK FITZGERALD, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Vault-Light; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to a form for the "bull's-eyes" or lenses adapted for insertion in a sidewalk or deck or floor, to shed light into a room or vault below without obstructing the traffic over head or being liable to fracture thereby, and without transmitting the images of passing objects.

Figure 1 is a perspective view of a lens embodying my improvements.

Figure 2 is a vertical section through a pavement provided with my improved lights.

The lens A may, in its horizontal section, be circular, as shown, or in the form of a hexagon or a diamond or other shape. The upper surface has protuberances, *a*, formed by intersection grooves, as shown or otherwise, for the twofold object of preventing slipping of pedestrians and of obscuring the outlines of passing objects, while at the same time increasing the refraction and transmission of light. The grand feature of novelty in my lens consists of the three ridge-like protuberances *b c c'*, from the under side of the lens, of which the ridge or protuberance *b* occupies a central position and possesses the greatest prominence, the ridges *c* and *c'* being arranged one on each side of and parallel to *b*. All of the ridges have the rounded form indicated, and are separated by rounded valleys or depressions *d d'*. The beneficial effects of the ridges *b c c'* are manifold and obvious. They cause a powerful and multifarious refraction and reflection of the light, which, besides diffusing it equally over the vault or chamber to be lighted, also enhances the aggregate illumination. They completely obscure the image or outline of objects passing over them. They serve to very effectually strengthen the lens. A floor provided with such lenses is found to transmit more light than the unoccupied holes, because the light which would be absorbed by the sides of the hole is both refracted and reflected downward by the lens.

Compared with lenses having a smooth upper surface and an under surface composed of equal angular ridges, my lens possesses several important advantages. The rounded contour and unequal depth of the bottom ridges or protuberances cause a remarkable and highly luminous refraction, which penetrates every part of the vault. The deeply projecting central rib *b* in particular, reaching down farthest into the room or vault, not only strengthens the lens where most necessary, but illuminates portions of the vault very slightly affected by the less prominent projections, while the rounded contour, besides imparting strength, adds to the diversity of refraction and reflection, and is also free from the tendency to prismatic decomposition of the transmitted light, which occurs with the angular forms of lenses.

I claim herein as new, and of my invention—

A vault-light, having a grooved or otherwise uneven upper surface and an under surface composed of a series of rounded parallel ridges *b c c'* of unequal depth, with intervening rounded valleys *d d'*, as and for the purposes set forth.

In testimony of which invention I hereunto set my hand.

FREDERICK FITZGERALD.

Witnesses:

GEO. H. KNIGHT,

JAMES H. LAYMAN.