

J. K. INGALLS.
Illuminating Vault-Covers.

No. 146,074.

Patented Dec. 30, 1873.

Fig. I.

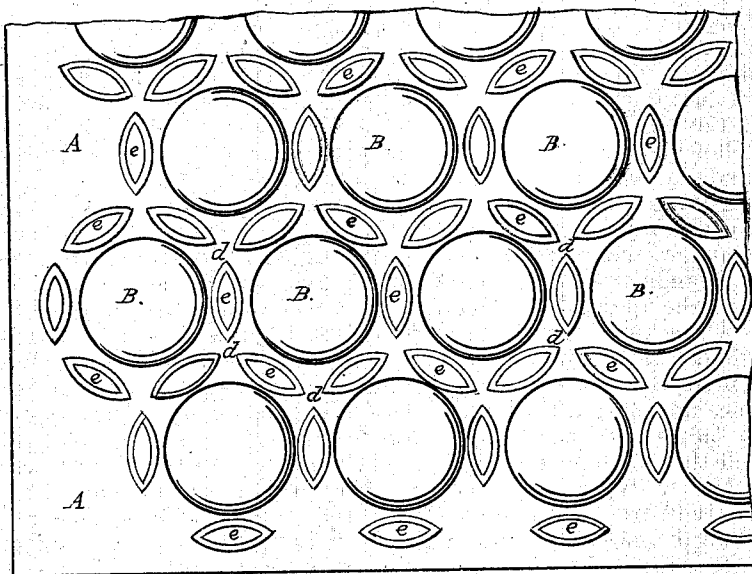
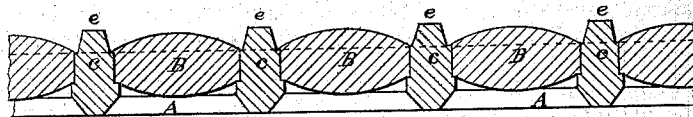


Fig. II.



Witnesses:

R. M. Jones.
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UNITED STATES PATENT OFFICE.

JOSHUA K. INGALLS, OF STARKEY, NEW YORK.

IMPROVEMENT IN ILLUMINATING VAULT-COVERS.

Specification forming part of Letters Patent No. **146,074**, dated December 30, 1873; application filed September 20, 1871.

To all whom it may concern:

Be it known that I, JOSHUA K. INGALLS, of Starkey, Yates county, in the State of New York, have invented an Improvement in Illuminating-Plates for Covering Vaults, Areas, &c., of which the following is a specification:

In vault-covers and illuminating-plates, as heretofore used, the glasses, which have been mainly made of a circular form, have been protected from breakage and abrasion by knobs placed in the triangular spaces formed by the arrangement of the apertures in which the glasses are set. These knobs have usually been made of a cylindrical or conical form. Their surfaces presented to the foot are necessarily small, and hence uncomfortable to walk upon, especially for ladies with light shoes; and these knobs, while they increase the weight of the plate, do not add to its strength, since the angles in which they are placed are already far stronger than the narrow web which separates the glasses where they approach nearest to each other; and experience has abundantly shown that, whenever a plate is broken by excessive load, or by unequal shrinkage of the metal, it is through these narrow parts, where the approach of the apertures to each other and to the edge of the plate leaves the smallest proportion of metal.

My invention has for its object to obviate these defects; and consists in so arranging knobs or protuberances as to strengthen the plate at its weakest points, and afford better protection to the glasses, and also to furnish a surface better adapted for walking upon.

Figure 1 is a plan of an illuminating-plate embodying my improvement. Fig. 2 is a vertical section, showing the arrangement of the protecting parts through line *xx* of Fig. 1.

As represented in the drawing, A indicates the plate or grating, which is preferably made of cast metal, and of such size and strength as to best adapt it to the space which it is intended to cover. This plate is provided with a series of perforations, which receive the glass disks or lenses B B, which are supported by a seat, and secured by a filling of cement or metallic packing. The lenses are preferably arranged in triangular order, to economize space,

leaving the metal disposed in a thin web, *c*, where their sides are contiguous, and in solid triangular masses *d* in the center of each series of three. On the top of the plate A, and immediately over the web *c*, I form an elongated guard or protuberance, *e*, rising above the general surface, and situated between the lenses at their point of nearest approach. The repetition of this protuberance on each of the intervening bars or webs *c c* forms, apparently—owing to the arrangement of the glasses—a border, consisting of six elongated knobs surrounding each lens, which affords adequate protection to the glasses, being elevated above their level, and gives sufficient extent of surface to be trodden upon without discomfort to the feet.

By increasing the depth or thickness of the web or bars in this manner, the metal is so disposed as to increase the strength where most required without materially adding to the weight of the plate, or diminishing the size or number of the apertures for illumination, while, at the same time, the protuberances are brought in close proximity to the glass, and more effectual protection is obtained.

It is obvious that the same results would be obtained in an arrangement of the illuminating-orifices in a rectangular order, or with apertures for illuminating of an oblong form, provided the protuberances are so arranged as to surround, or nearly so, the lenses or glasses, and to occupy the weakest intervening portions of the plate, being the points where the lenses approach most nearly to one another.

I claim—

In combination with a vault-cover, the ribs or protuberances *c c* arranged to surround, or partially surround, the lenses B B, for strengthening the iron plate and forming a better surface for walking upon, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSHUA K. INGALLS.

Witnesses:

OLE H. HOLBERG,
K. N. JONES.