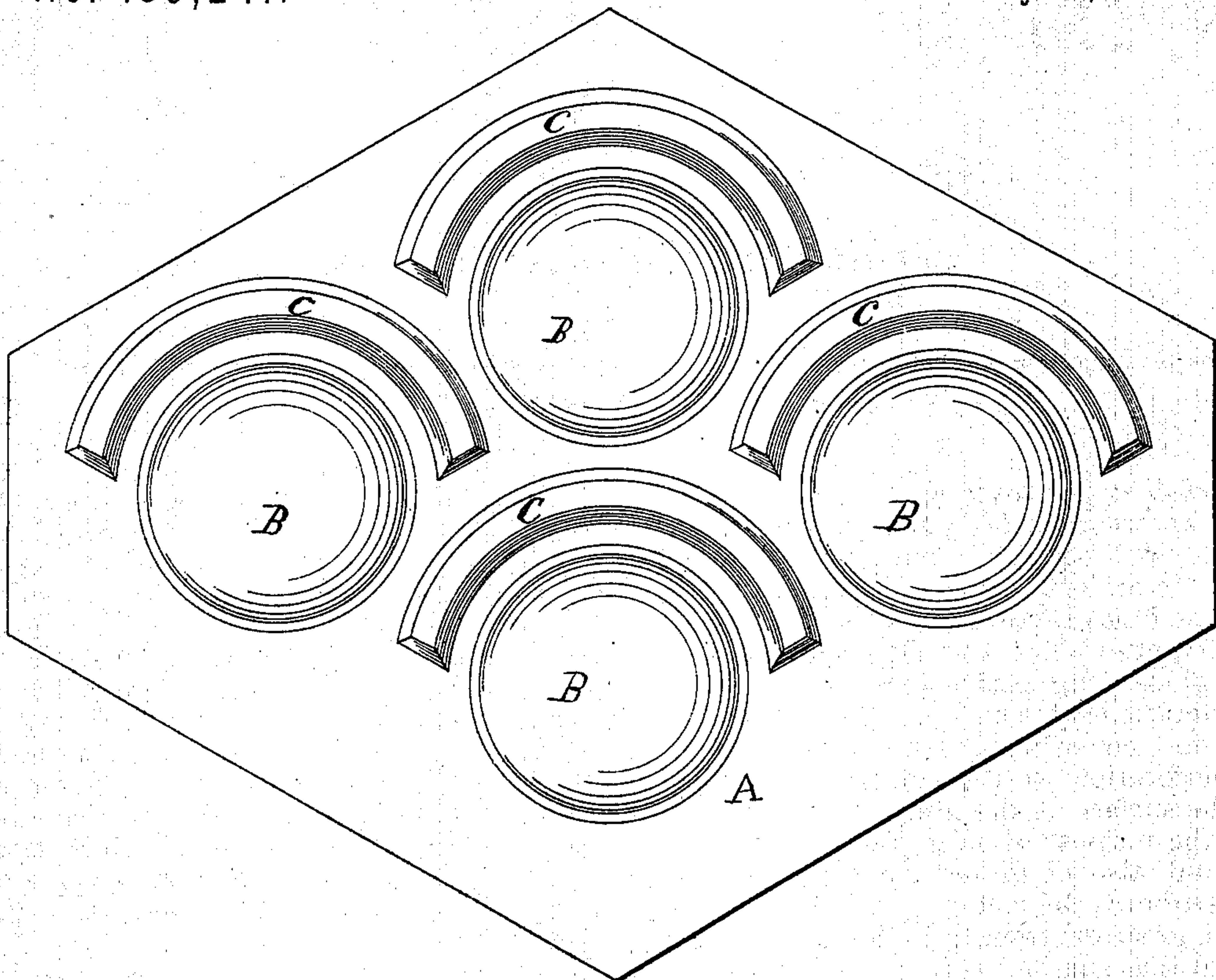


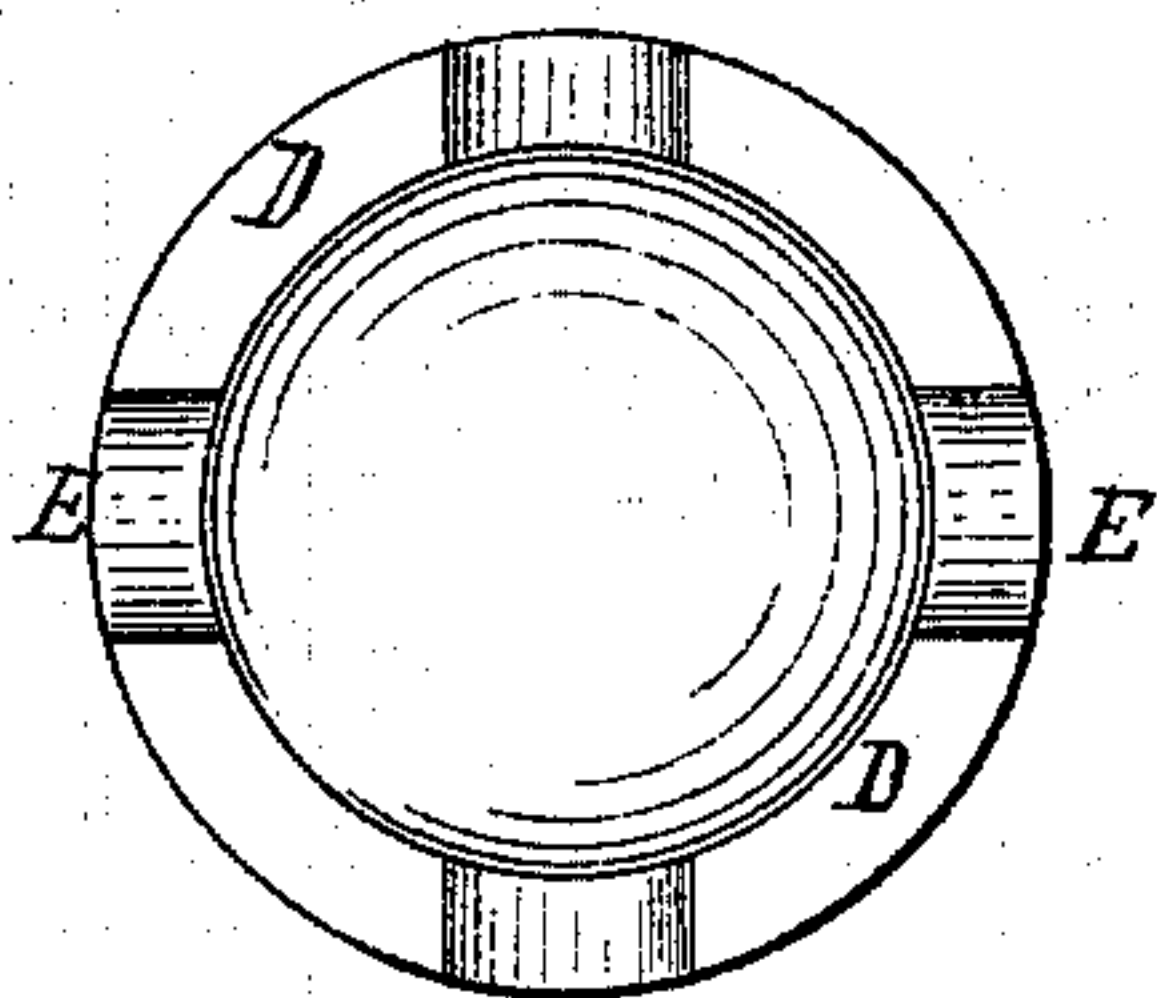
**J. C. FRENCH.**  
**Vault-Covers.**

No. 139,241.

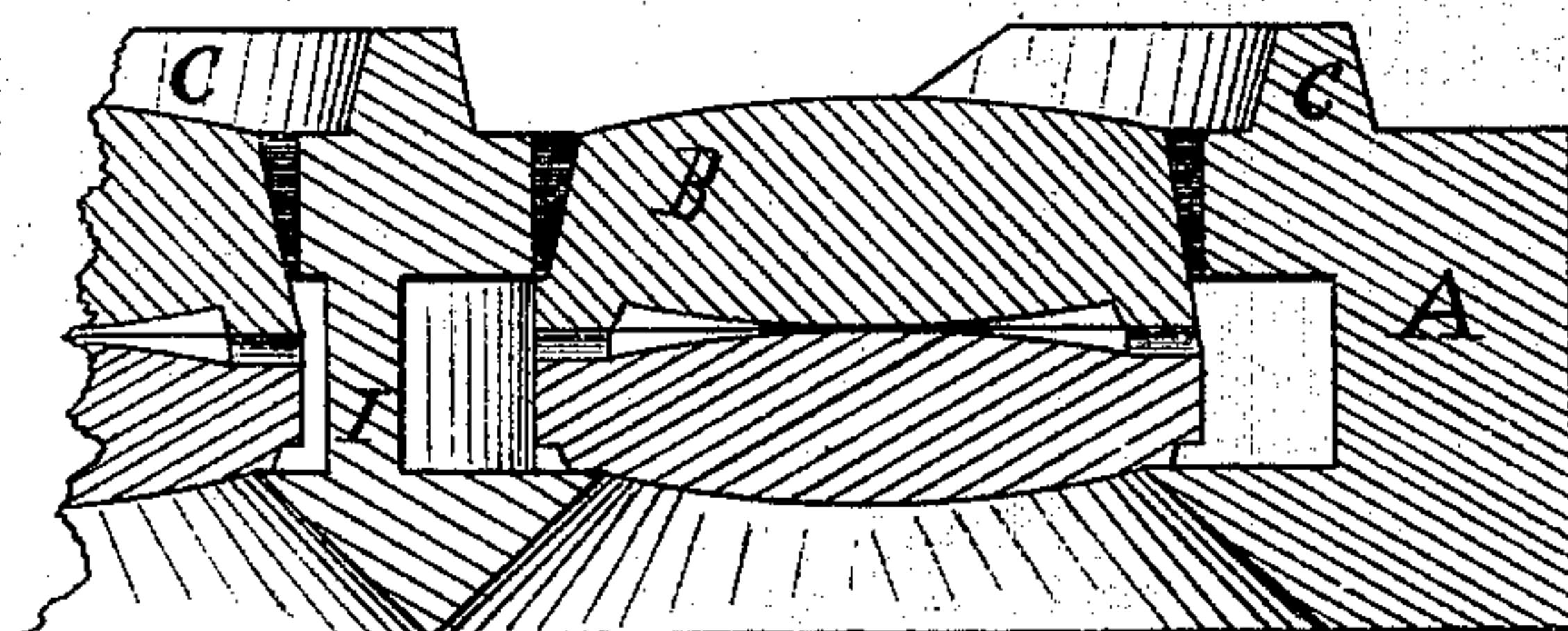
Patented May 27, 1873.



**FIGURE 1.**



**FIGURE 2.**



**FIGURE 3.**

WITNESSES

*James Ables.*  
*Fred L. Hemmery.*

INVENTOR.

*James C. French*



# UNITED STATES PATENT OFFICE.

JAMES C. FRENCH, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN VAULT-COVERS.

Specification forming part of Letters Patent No. **139,241**, dated May 27, 1873; application filed November 21, 1872.

*To all whom it may concern:*

Be it known that I, JAMES C. FRENCH, of Chicago, Cook county, Illinois, have invented certain Improvements in Vault-Lights, of which the following is a specification:

My invention relates to the construction of vault-lights, using perforated plates of iron, the perforations of which are filled with glass lenses, and consists in partially surrounding each perforation with a rib, cast or worked upon the surface of the iron plate. This rib serves the purpose of strengthening the iron plate and also of protecting the glass. It also distributes the metal in such a way as to give the greatest strength to the least amount of metal that can be used for the purpose.

Figure 1 represents a top view of my vault-light, showing the rib surrounding the perforation. Fig. 2 is a view of one portion of the lens. Fig. 3 is a sectional view through the center of one of the lenses, and also a cross-section of the ribs.

Similar letters of reference refer to similar parts in the drawing.

A is the iron frame. C C are ribs partially surrounding the perforations in the iron plate. B are lenses placed in the perforations in the iron plate. These lenses are made either in single or double forms; the kind shown in

Fig. 3 is the double form, and between the two lenses is an air-space. I also make the plate A of double form with an open or hollow space between the two plates, with posts extending from one plate to the other, across the opening, as shown in Fig. 3, the post being shown at I. Certain portions of the edge of one of the lenses is cut away, as shown at E, Fig. 2. The remainder, shown at D, is left, forming lugs; this forms an air-space in each lens used.

I do not confine myself to the use of double lenses or to the use of double or hollow plates of iron. I can use, with as great advantage, my improvement with single lenses and single plates of iron.

This arrangement and use of the ribs C C strengthens the iron plate between each and every perforation where it is the weakest. It also presents a smoother surface to the foot than forms hitherto used, while ample opportunity is afforded for water to pass off.

I claim—

The ribs C C, in combination with a vault-light for the purpose of strengthening the iron plate, substantially as described.

JAMES C. FRENCH.

Witnesses:

JAS. A. COWLES,  
FRED. L. KIMMEY.