W. DALE.

Vault-Covers.

No. 156,412. Patented Nov. 3, 1874.

Fig. 1.

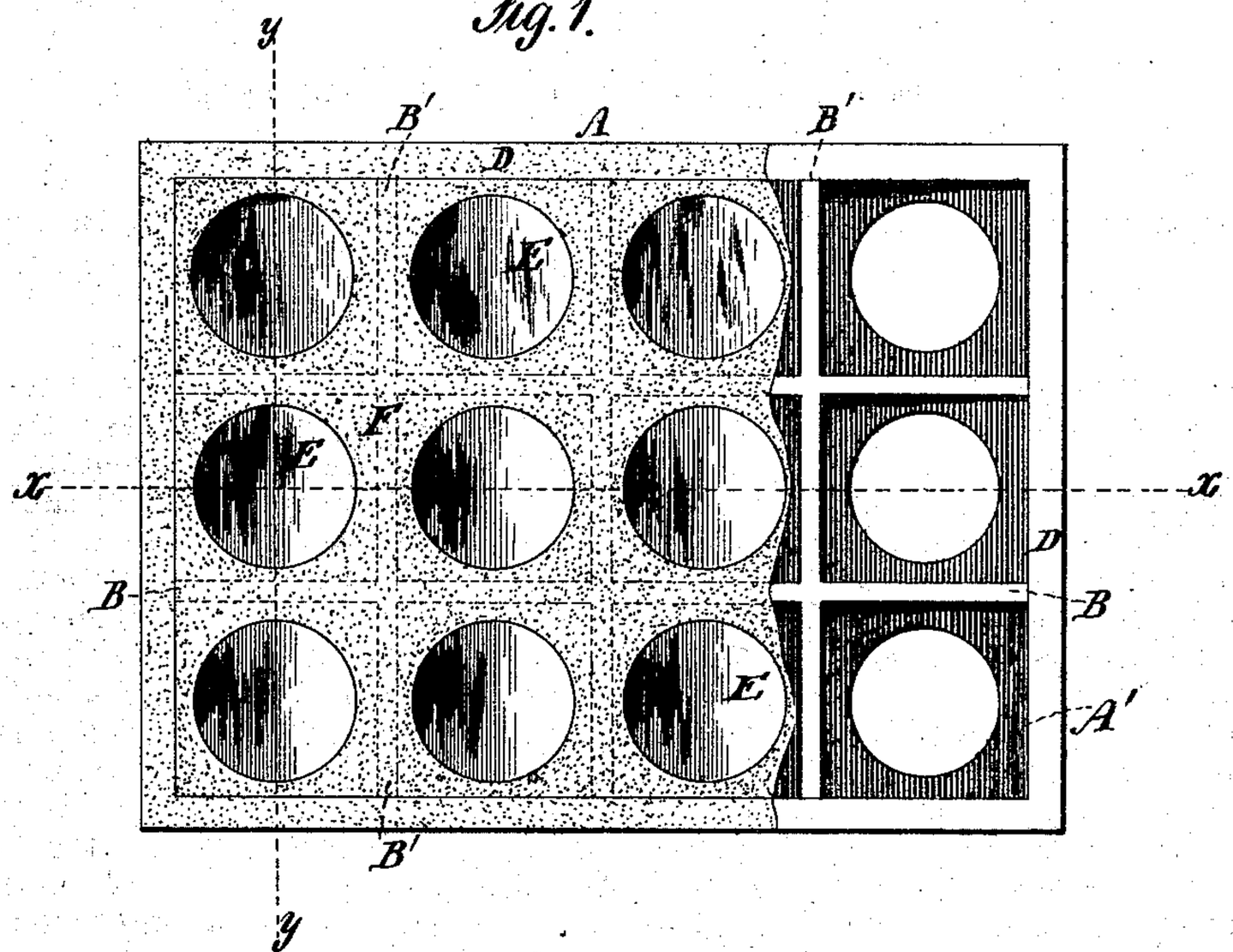


Fig. 2.

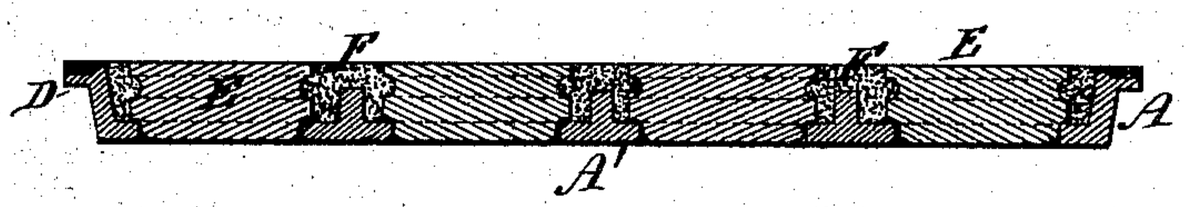


Fig. 3.

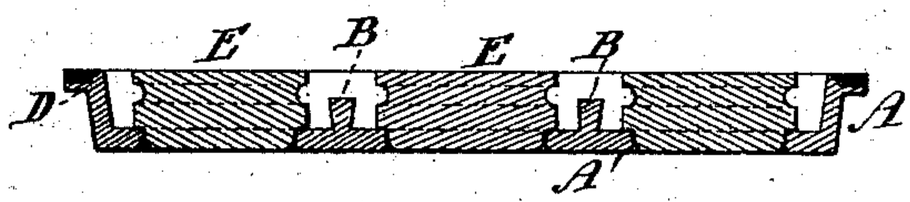
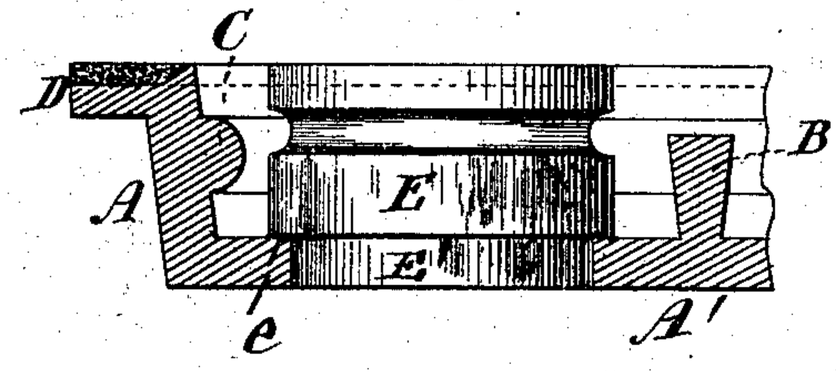


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM DALE, OF NEW YORK, N. Y.

IMPROVEMENT IN VAULT-COVERS.

Specification forming part of Letters Patent No. **156,412**, dated November 3, 1874; application filed October 23, 1873.

To all whom it may concern:

Be it known that I, WILLIAM DALE, of the city, county, and State of New York, have invented a certain Improvement in Vault-Covers, of which the following is a specification:

This invention relates to that class of devices which are used in sidewalks and in other positions for the purpose of lighting the vaults that may be formed under them; and it consists in what may be termed a method of construction, as will be more fully set forth hereinafter.

Figure 1 is a plan view of my improved cover, showing the construction of metal portion as adapted for the reception of the glass bull's eyes and of the cement which is used for retaining them in position. Fig. 2 is a sectional elevation on line *x x* of Fig. 1, showing the metal frame, the form of the bull's-eyes, the method of applying them, and the cement for holding them in position. Fig. 3 is a transverse section on line *y y* of Fig. 1, in which the cement is omitted for the purpose of showing the form of the cavities into which it is poured. Fig. 4 is a sectional elevation of a portion of the metal frame and one bull's-eye upon an enlarged scale, for the purpose of more clearly illustrating their construction and the method of uniting them, and also for showing a dovetailed form of rib or partition between the different compartments of the frame.

Corresponding letters refer to corresponding parts in the several figures.

It is well known by experts in the business of selling textile fabrics that the best possible place for exhibiting their good qualities is in the vault under the sidewalk, or in some other position where the rays of light fall vertically upon them; and in order that this may be done in the vaults above referred to, and thus room of great value be utilized, it is indispensable that the device employed for admitting the light should be absolutely water-tight, in order that no wetting of the goods shall take place while they are being exhibited or during the time that they may be under the light.

Vault-covers, as heretofore generally constructed, have been subject to considerable changes of dimensions, and consequently to derangement of their parts, owing to the fact that so much of the surface of the metal—of which they have been in part composed—has been exposed to the rays of the sun and to the temperature of the atmosphere outside of such covers, thus causing them to be expanded by the heat and contracted by the cold until breaks have been caused, however tight they may have been when placed in position.

I have heretofore provided a remedy for the above-named and other defects by so constructing a cover that it shall admit the light freely and at the same time exclude, at all times and under all temperatures, water from the vault or room below. This result is accomplished by constructing a vault-cover, substantially as described in my reissued patent. In accordance with my present improvement, I construct it of a frame, A, of cast-iron or other suitable metal, such frame consisting of a plate or disk, A′, which may be rectangular, circular, or of any other form that will adapt it to the openings to which it is to be applied. Through the disk or plate apertures are formed for the reception of a circular projection upon the bottom of the bull's-eyes. Around the periphery of the frame an upwardly-projecting flange is formed, the upper surface of which is flush with the upper surface of the bull's-eyes, between which there are transverse flanges B B′, which rise from the disk or plate A′ to one-half, more or less, of the height of the outer flange and of the bull's-eyes. These flanges are, by preference, of dovetailed form, shown in Figs. 3 and 4, in order that they may the more securely hold the cement in place.

In Fig. 4, I have shown an inwardly-projecting ledge, C, which I prefer to have placed upon the inner surface of the frame A, so that, as the cement is poured or pressed in around the bull's-eyes, it may pass in behind or below such ledge, and thus be held more firmly in position when it becomes hardened. The ledges referred to may in some cases be omitted, the frame being constructed as shown in Figs. 2 and 3, which form of construction will answer very well when small frames and bull's-eyes are used, but for larger ones the form shown in Fig. 4 will be found to be preferable.

Lateral flanges D are formed upon the vertical flanges of the frame, either flush with the top of the latter or a little distance below the top thereof, in which latter case they will be covered with cement. The vault-cover is supported by these flanges D either upon a frame

inserted in the sidewalk or upon the walk itself, or upon a shelf formed therein.

In order that provision may be made for the passage of light through the device bull's-eyes E E of glass are inserted. Their form is that shown in the drawings, where it will be seen that upon the lower end of each there is a projection which nearly or quite fills the aperture formed in the frame, as shown in Fig. 1. This projection is of such length as to allow the under surface of the bull's-eye to come down flush with the under surface of the frame, while the whole length of the eye is such as to cause its upper surface to be flush with the upper surface of the upwardly-projecting flange thereof. For the purpose of more effectually securing the eyes in position they are furnished with a groove which is formed in their peripheries, so that as the cement is placed around them it shall fill such groove and thus prevent the possibility of the removal of the eye. The eyes are secured in the frame and made watertight by means of what is known as Portland cement, or it may be by any other kind which is capable of being applied in a semi-liquid state, or of such consistency as will cause it to fill the spaces between the eye and the surrounding metal, and afterward of becoming hard, as the first-named kind will do.

The method of applying the cement is clearly shown at F F, in Figs. 1 and 2, where it will be seen that its upper surface is even with that of the frame and the bull's-eyes, so that when the device is complete it presents an even and level surface for the people to walk upon. It will also be seen that the cement extends some distance above the upper surfaces of the transverse flanges or partitions B and B′, protecting almost the entire body of the metallic frame from the rays of the sun and the effects of changes of temperature outside of the cover, the cement being a non-conductor, or at least a poor conductor, of heat, and being applied in the semi-liquid or plastic state, renders it certain that, with sufficient care in applying it, the most minute spaces between or cavities in the parts will be filled, and that thus a water-tight vault-cover will be made which will not be affected to such an extent by the changes of temperature to which it is exposed as to cause it to become leaky by long-continued use.

I have described my improvement as peculiarly applicable to vault-covers; but it is also applicable to the roofs of buildings, the only change required being in the flanges upon which it rests, which should be so constructed as to cause them to overlap each other and have a recess for the insertion of cement in such a manner as to prevent any leakage between them.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The grooved bull's-eyes E, provided with a shoulder, E, by which they are supported on the bottom plate of the dish, and reduced ends E′ fitting the apertures in the latter, substantially as specified.

2. The metal dish A A′, provided with dovetailed or under-cut ribs B, which terminate some distance below the upper surface of the dish, substantially as and for the purpose specified.

3. The metallic dish provided with the inwardly-projecting ledge C, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM DALE.

Witnesses:
D. P. HOLLOWAY,
B. EDW. J. EILS.