(No Model.)

E. VEDDER.

ILLUMINATED STRUCTURE.

No. 259,346. Patented June 13, 1882.

Fig. 1.

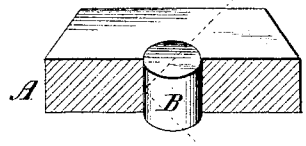


Fig. 2.

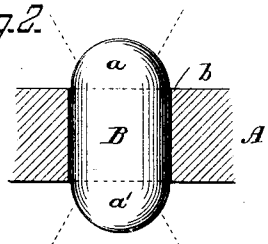


Fig. 3.

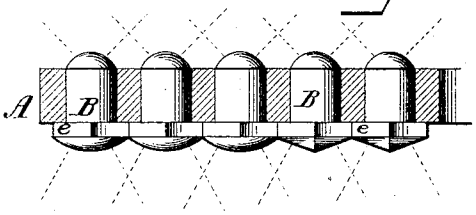


Fig. 4.

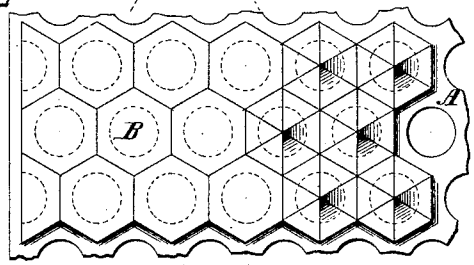


Fig. 6.

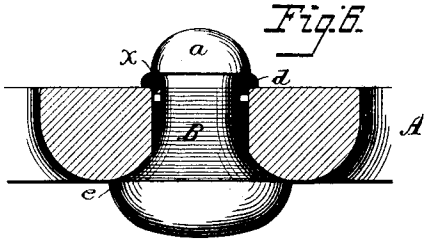


Fig. 5.

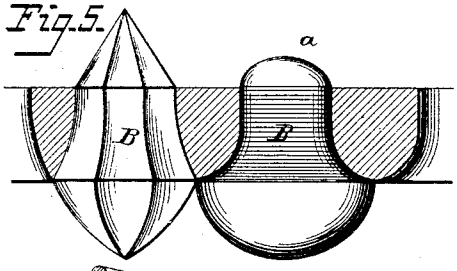


Fig. 8.

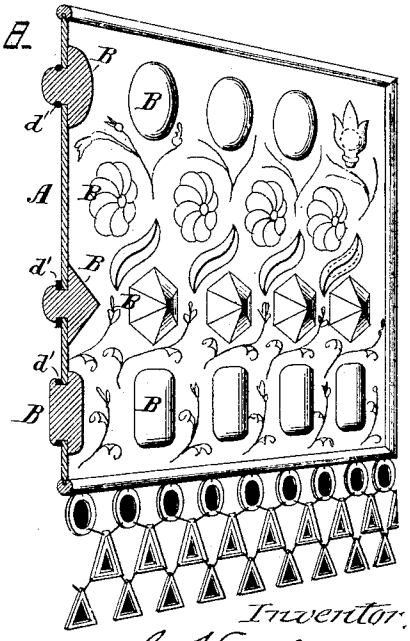
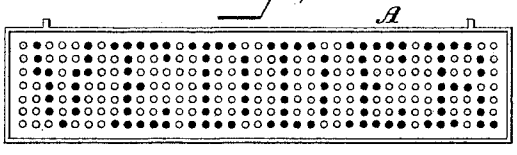


Fig. 7.



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UNITED STATES PATENT OFFICE.

ELIHU VEDDER, OF NEW YORK, N. Y.

ILLUMINATED STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 259,346, dated June 13, 1882.

Application filed March 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, ELIHU VEDDER, of the city, county, and State of New York, have invented certain Improvements in Illuminated Structures, of which the following is a specification.

The object of my invention is to secure an improved illumination and in some cases a more ornamental and artistic effect in those structures where light is transmitted through blocks of transparent or translucent substance set in opaque frames, plates, or sheets of any material; and such effects I secure by the means hereinafter fully described.

In that class of structures in which glass blocks, crystals, or transparent mineral substances are set in opaque frames or plates—such as vault-lights, skylights, lead sash ornamental screens, &c.—there is great loss of light from the amount of non-transparent space occupied by the frame or setting. As only the direct rays passing at right angles to the face of the setting are transmitted freely, the amount which penetrates the screen when the source of light is at an angle to the structure is relatively very small. The small illuminating-power of such structures is further due to the shape of the ends of the blocks, which are such that the rays generally leave the inner surface in almost parallel lines.

In my improved structure I use a suitable support, which I term generally a "frame," although it may be rigid—as of metal—or flexible—as of leather, felt, or cloth—and I collect and transmit a greater number of light-rays and disperse the same on the side to be illuminated by silvering or imparting to those parts of the blocks embedded in the frame a polished reflective surface, forming a solid speculum, so that rays of light penetrating the block and striking such reflecting-surface at any or various angles, instead of being absorbed by the surrounding frame or refracted, will be reflected at different angles through the block into the space upon the other side, and the dispersion of the rays will greatly increase the area over which the light is distributed. This reflective surface may be formed by silvering the glass block or by inclosing the same in a polished sheet, sleeve, or band of any suitable material, or in any manner that may be found effective; and when colored glass is employed the greater amount of light transmitted permits of the use of deeper colors, and thus secures a rich tone and brilliant effect not otherwise obtainable. To further aid in the collection of the rays of light I extend the block above the supporting-surface, rounding the same, so that the light-rays falling in different directions, instead of being refracted, will be bent and transmitted through the body. In like manner I extend the lower ends of the blocks through and beyond the supporting-frame, imparting much greater width to such ends than to the body, and round or swell the same, so that the light-rays, instead of passing parallel, shall be dispersed radially. In some instances I widen the inner ends of the blocks to form flanges, completely covering the supporting-frame, no portion of which is exposed, thus affording a transparent covering through which the light is spread in a manner to make the entire surface more or less luminous, the diffusion of the light being such as to hide the casing, producing fine effects and securing a better illumination than would otherwise be possible. By combining these elements in one block—that is, imparting an outer reflecting-surface and rounding the upper and swelling the lower end—I am enabled to secure a most effective collection, transmission, and dispersion of the light.

It has been common to cement the blocks in the supporting-frames, to clamp them between plates, and secure them by metal flanges, all of which modes are objectionable from the skill required to make the attachment and from the reduction of the extent of the luminous surface. To avoid these objections, as well as obtain other advantageous results, I make studs of the transparent or translucent material, which studs have shouldered ends projecting beyond the face of the frame, and I shrink rings or washers of rubber or soft metal between said shoulders and the frame, so as to retain the studs in place and form water-tight joints.

The accompanying drawings show in detail the various constructions to which I have referred. Figure 1 is a sectional view of a plate, A, showing a transparent or translucent block,

B, embedded therein, and the effect of the mirrored surface upon a ray of light striking the block at an angle. Such blocks may be of any size and shape, and set in the frames of skylights, vault-covers, in the walls of buildings, or sides of ships, as may be found advisable.

Fig. 2 shows the block B, provided with rounded ends *a a'*, which collect and disperse the light, as shown by dotted lines, a metal sleeve, *b*, having a polished inner surface, surrounding the block and constituting the speculum; or the inner edge of the opening in the frame may be silvered to form the reflecting-surface.

Fig. 3 is a section through a plate or frame, showing blocks B, with their lower ends enlarged and bulged, forming flanges *e*, which meet each other so as to cover the whole face of the plate, the ends of the blocks being in some cases round and in others pyramidal.

Fig. 4 is an inverted plan of Fig. 3.

Fig. 5 is a view showing a block the stem of which swells gradually toward the edge of the lower flange and is silvered, thereby presenting a portion of the silvered surface toward the lower face of the block. When a series of such studs are combined and the flanges extended to meet each other the silvered surface completely hides the frame.

Fig. 6 shows the block with the upper end, *a*, enlarged to make a shoulder, *x*, below which a ring, *d*, of lead or other soft material, is shrunk, forming a tight packing between the shoulder and the plate or frame A, thereby securing the stud in place and excluding moisture. As the end or head *a* of the stud overlies the packing, a most effective joint is thus produced, while the receiving end is not covered to obstruct the light. I may, if desired, place a rubber sleeve upon the stem of the stud, and thus pack the joint between the same and the frame. This construction affords special facilities in securing and removing the studs, permitting changes to be made from time to time with little trouble and at little expense. This is specially applicable in the manufacture of illuminated signs, as shown in Fig. 7, where the plate A, of cast-iron or other material, has numerous openings to receive the studs, which are disposed in one color—say red—so as to form the requisite device, the remaining openings being plugged up or filled with opaque studs or those of a different color—say white.

Fig. 8 shows the studs provided with grooves in which to insert rubber rings *d'*, that hold the studs in place. This construction is specially adapted for securing the studs to a support consisting of leather or other flexible fabric, so as to constitute illuminated hangings or curtains suitable for lambrequins, screens, and many other useful and ornamental purposes, the face of the curtain being painted, embossed, or embroidered, if necessary, and a fringe may be formed of colored glass links connected together by wires, clamps, or otherwise, as described in a separate application for Letters Patent. The studs may be of different shapes, as shown, as may also the expanded light-dispersing ends.

I claim as my invention—

1. In articles constructed for illuminating purposes by the transmission of light through blocks or studs set in opaque supports or frames, a reflective surface around the stem of the stud at the parts not exposed directly to the light, substantially as set forth.

2. The studs having the shanks curved outward to meet the enlarged ends, and provided with a reflecting-surface around the shank, as specified.

3. The combination, with the frame, of a series of studs set therein, and each enlarged at the end to form a flange, shaped as specified, to meet those of the other studs and cover the entire face of the frame, substantially as described.

4. The combination of a frame having a series of openings, a series of studs adapted thereto, and provided each with a head at one end and shoulder *x* at the other beyond the face of the frame, and a washer contracted between said shoulder and the frame and securing the stud detachably, substantially as set forth.

5. The combination, with a flexible continuous pliable non-transparent curtain or sheet, of transparent or translucent studs secured in openings in said sheet, substantially as set forth.

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

ELIHU VEDDER.

Witnesses:
CHARLES E. FOSTER,
WILLIAM PAXTON.