

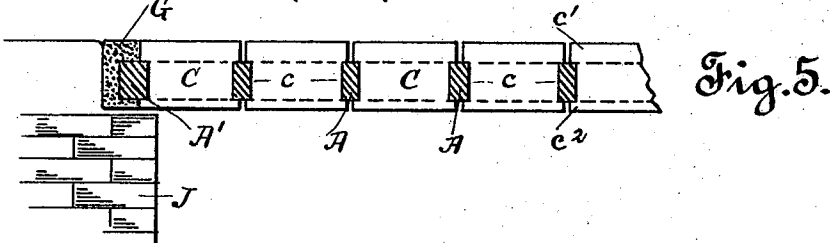
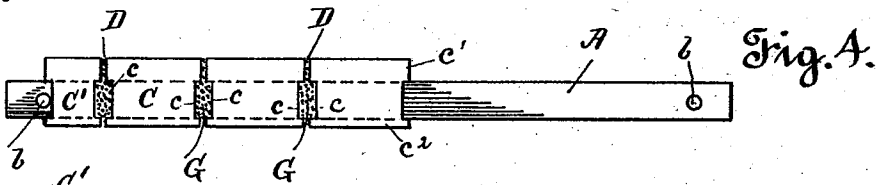
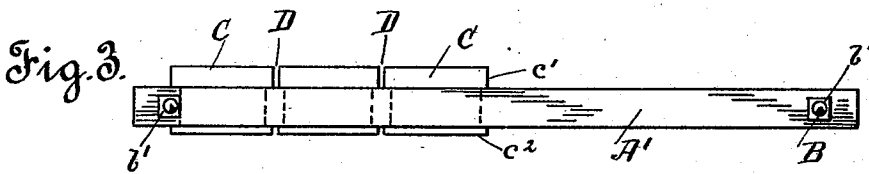
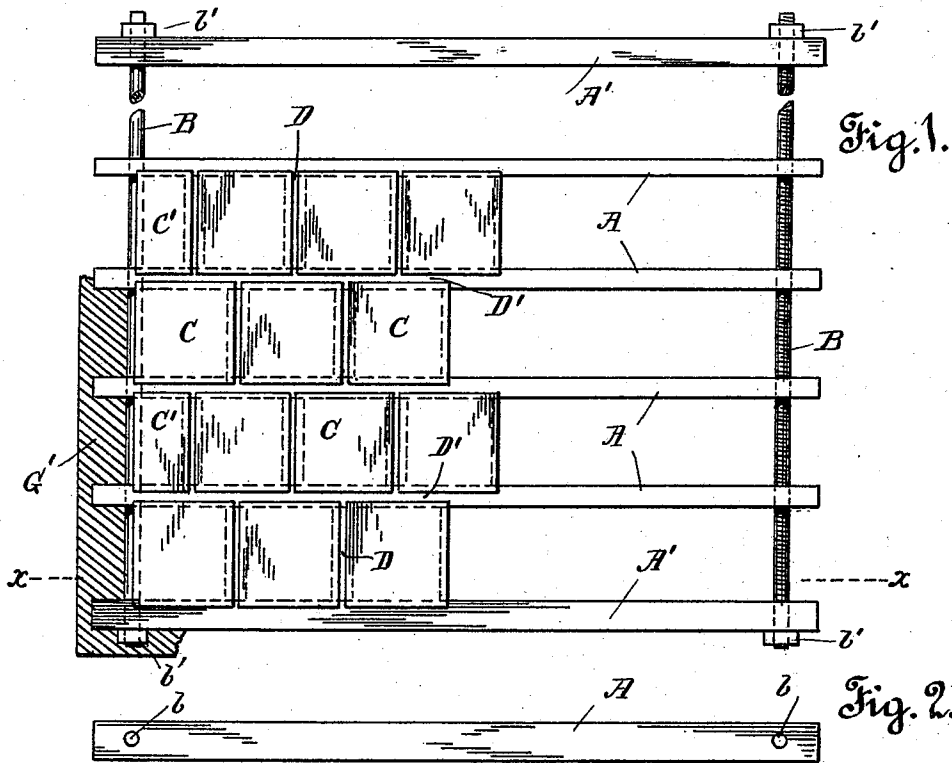
(No Model.)

2 Sheets—Sheet 1.

H. HAUSTEIN.
FRAME FOR ILLUMINATING TILES.

No. 501,008.

Patented July 4, 1893.



Witnesses.

H. H. Haustein
A. A. Baxter

Inventor

Henry Haustein
by A. H. Ste Marie.
attly

(No Model.)

2 Sheets—Sheet 2.

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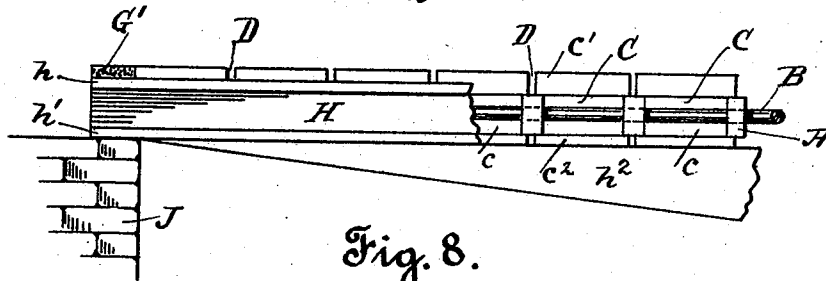
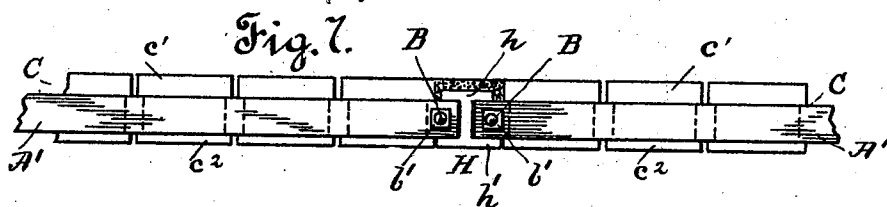
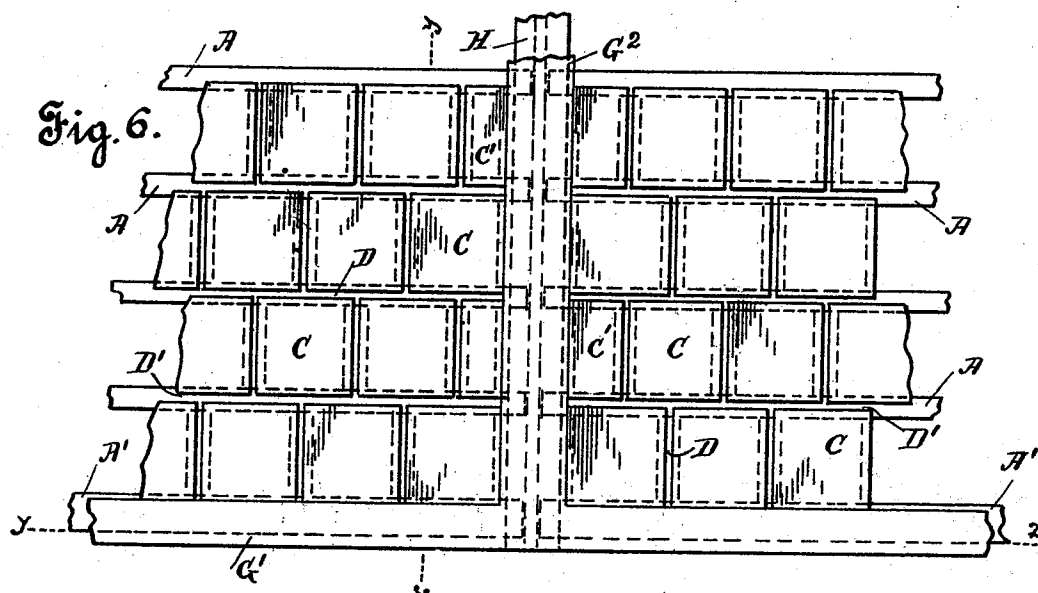
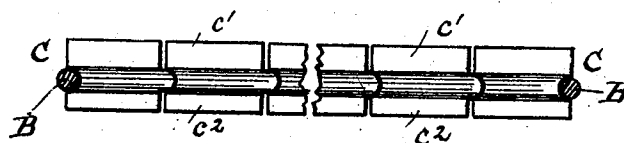
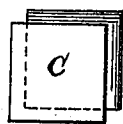
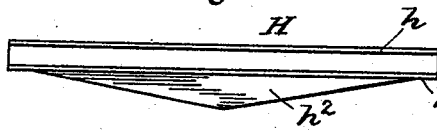


Fig. 10.



Witnesses.

H. Fontenay
A. Rater



Inventor.

Henry Haustein
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att'y

UNITED STATES PATENT OFFICE.

HENRY HAUSTEIN, OF SAN FRANCISCO, CALIFORNIA.

FRAME FOR ILLUMINATING-TILES.

SPECIFICATION forming part of Letters Patent No. 501,008, dated July 4, 1893.

Application filed March 13, 1893. Serial No. 465,821. (No model.)

To all whom it may concern:

Be it known that I, HENRY HAUSTEIN, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented new and useful Improvements in Frames for Illuminating-Tiles, of which the following is a specification.

My invention relates to vault-lights, that is to say that class of glazed covers used in side-walks, roofs, floors, partitions, &c., for the purpose of admitting light into places situated below or near the same.

The object of my said invention is to provide an improved mode of construction for the class of devices above referred to that will make them simpler and less costly to build, lighter in bulk and yet possessed of more strength, and neater in appearance than any similar structure heretofore devised. I gain in simplicity and cheapness by doing away with some useless pieces that are wrongly considered as essential features of the frame in which the lenses are set, and which in fact tend to weaken rather than strengthen it; also by combining the reduced number of parts so they may be brought together with less work, greater ease, and dispatch. Strength and lightness are secured by the judicious assemblage of bearers or beams, bars, and rods forming a frame of a thickness varying in proportion to the strain it has to bear and within which are lodged lenses of corresponding design laid out in adjacent rows and united by cement or concrete that fills the intervening spaces. As to elegance of outline and detail, it is produced by having the glasses formed and the cement or concrete filling applied in such a manner that the supporting frame is practically hidden from view, thereby giving the tile-work a smooth and trim appearance not to be found where the frame and the unsightly cross-bars commonly employed are visible at the surface.

Referring to the accompanying drawings, in two sheets, for a detailed description of my invention,—Figure 1 is a broken top view of my improved tile, the filling removed, and the border shown in section. Fig. 2 is a side elevation of one of the bars of increased thickness that are used at the ends of the tile-frame. Fig. 3 is an end view of the tile-frame, partly glazed as shown in Fig. 1, looking from

the lower line of the latter figure. Fig. 4 is a vertical section taken from the line $x\ x$, Fig. 1. Fig. 5 is a similar view taken from the line $x\ y$, Fig. 6. Fig. 6 is a broken top view of two tiles connected with a bearer or beam covered with filling material, showing also a border of cement or concrete. Fig. 7 is an elevation of the tiles and bearer on the line $y\ z$, Fig. 6, the border being removed, as also the flange from under the bearer. Fig. 8 is a partly-broken side elevation of the bearer and of one of the tiles supported thereby. Fig. 9 is a section of a tile of modified form, the lenses of which are tongued and grooved and self-supporting within a frame having neither longitudinal nor transversal inner bars. Fig. 10 is a plan of one of said tongued and grooved lenses. Fig. 11 is a side elevation, on a reduced scale, of the bearer or beam that forms part of my improved construction.

The same parts are indicated by the same letters of reference throughout all the views.

A represents metallic bars that are laid edgewise parallel with one another and are designed as supports for the lenses entering into the composition of my improved illuminating-tile. These bars are formed with plain rectangular sides and may vary in thickness according to how close or how far it is desired to have the various rows of glasses stand with relation to the adjoining ones. The end-bars A' are of increased thickness, usually double the size of the others, so the tile may be stronger and the inclosed material may not press out.

B designates screw-threaded rods which fit within openings or holes b in the ends of the bars $A\ A'$ and are provided with a nut b' at each end. These rods serve to screw the bars and lenses together after the tile has been glazed. By preference, the rods B are threaded their full length, as shown on the right of Fig. 1, although plain rods may be used. Being fully threaded they may be sawed off at any point and will tend to make the tile-work more solid by forming a thread within the concrete or cement that covers them and which hardening when set holds the bars firmly in place.

The bars and rods above described constitute the frame of the tile, which, it will be ob-

served, is entirely devoid of cross-bars, such as are provided in other structures of the same class. This I consider a valuable feature of my invention, inasmuch as it simplifies the construction of illuminating tiles, materially reduces their cost, and avoids the recessing or notching of the bars at the intersecting points, which invariably weakens the tile frame. Constructed as described the frame can also be made and put together in quicker time, as all the bars can be punched at once to a templet without measuring or marking them. Having, moreover, the bars edgewise, as shown, it augments the area of lens surface and increases the strength of the frame considerably.

Within the frame, between the bars A A', are set the lenses C and half-lenses C', which are arranged in parallel rows that are unbroken by cross-bars and form as many different panels in the tile. These lenses or blocks of glass are preferably made in the shape of squares, or half-squares, and are usually provided with a rectangular groove c that runs around them on all four sides and forms outwardly-projecting upper and lower flanges c' c². The width of the groove c is such that the flanges c' and c² respectively bear upon the upper and lower edges of the bars, which are thus partly or wholly incased in glass according to their thickness. The flange c' is made much thicker than the flange c² so as to better resist wear. The lenses, as will be seen by reference to Figs. 1 and 6 are arranged within the frame in such a manner as to break joints, the object being to divide the strain upon different points of the bars and improve the general aspect of the tile.

Fig. 9 shows a modification of the lenses represented in the other figures. The difference in their construction consists in that the lenses illustrated in Fig. 9 are not entirely surrounded by a groove as in the case of the other lenses, but are tongued and grooved on opposite sides as shown. This construction enables me to discard the bars A in the tile-frame, retaining only the outer bars A' and the rods B, as the lenses are all bound together and therefore self-supporting. An illuminating-tile of this nature possesses the neat appearance and efficiency of one made of a single pane of glass and is preferable to the other kind where the tile is to be set up in a vertical position, for instance in windows of an elevator-shaft or in a partition between apartments in a building.

D represents the spaces intervening between the various lenses inserted into the frame. These spaces are filled with concrete or Portland or other cement G, which binds the lenses firmly together and imparts strength to the whole tile. The bulk of the concrete or cement lies, of course, in the grooves between the lenses, where its effect is more likely to be felt, but it comes out also more or less to the top and bottom, according as the lenses are set more or less close together. As to the

spaces D' between the different rows of lenses they are usually filled with the same material as the spaces D in order to cover the bars, but there also the width of the concrete or cement joints varies, being regulated by the thickness of the bars, which may be drawn or screwed up more or less closely.

G' indicates borders composed of same material as the filling between the lenses and which are laid down along the sides and ends of the tile-work when used to form a section of sidewalk.

The tiles are joined to one another by means of a bearer or beam H, as shown at Figs. 6, 7, and 8. The body of this bearer is in the shape of an I or double T-beam, and preferably made of metal. It is therefore made with parallel flanges h h', the lower of which is adapted to bear upon any suitable support, such as masonry or brick-work J. Besides the flanges h h', the bearer is also provided with an under flange h², which increases in width as the bearer is farther from its supports, being quite wide at the middle and gradually growing smaller as it nears the ends. This construction is fully shown at Fig. 11, and is calculated to strengthen the bearer without giving it unnecessary weight and bulk. But where lightness is required or admissible, the flange h² may be discarded, as indicated at Fig. 7. In putting the tiles in place, the sides of the frame through which the rods B run are brought within the upper and lower parallel flanges of the bearer so the flange h' will come flush with the under surface of the lenses whereas the flange h will be partly concealed between the tops thereof. A layer of filling material, concrete or cement, is then placed over the bearer and the rods of the tile frames on each side.

Having now described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. An illuminating-tile frame composed of parallel bars having holes at each end, screw-threaded rods passing through said holes, and nuts at both ends of said rods, substantially as set forth.

2. An illuminating-tile consisting of thin inner bars laid edgewise and provided with end holes, similarly-perforated outer bars of increased thickness, screw-threaded rods passing through the holes of all said bars, and lenses between the same, substantially as set forth.

3. The herein-described illuminating-tile construction comprising a bearer having parallel upper and lower flanges, tile-frames, and lenses the under surface of which is flush with the under surface of said lower flange, substantially as set forth.

4. The herein-described illuminating-tile construction comprising tile-frames thinner than the lenses therein, and a bearer having upper and lower flanges between which the sides of said frames may be inserted, substantially as set forth.

5. The herein-described illuminating-tile construction comprising tile-frames, lenses therein, a bearer between said frames provided with an upper flange partly concealed
5 by the tops of said lenses and a lower flange coming flush with the under surface of the same, and a layer of filling material extending over said bearer, substantially as set forth.

6. The herein-described illuminating-tile
10 construction comprising a bearer, frames borne by the same, upwardly-projecting

lenses, and layers and borders of concrete or cement covering and surrounding said bearer and said frames, substantially as set forth.

In witness whereof I have hereunto set my
hand and seal.

HENRY HAUSTEIN. [L. S.]

Witnesses:

A. O. BAXTER,

A. H. STE. MARIE.