(No Model.) 2 Sheets—Sheet 1.

J. K. INGALLS.

ILLUMINATING TILE.

No. 261,720. Patented July 25, 1882.

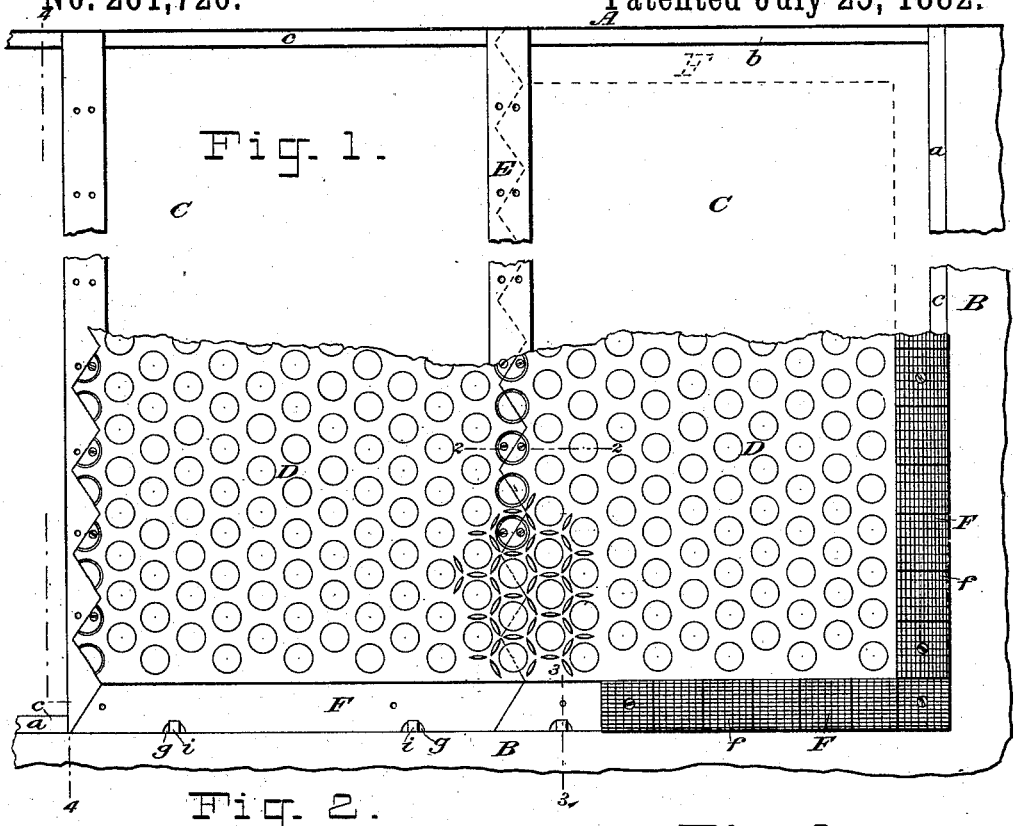


Fig. 1.

Fig. 2.

Fig. 3.

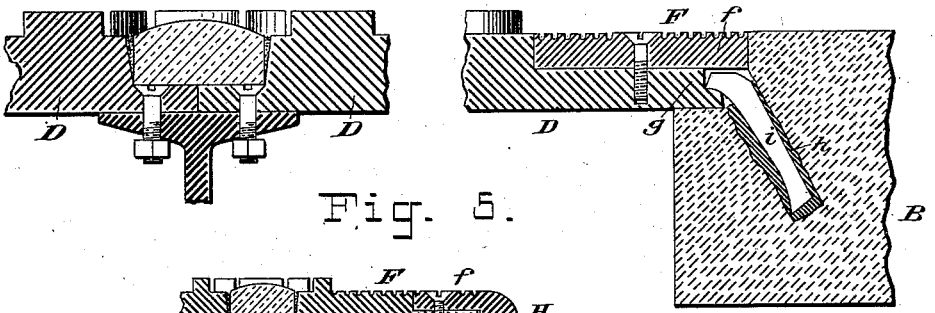
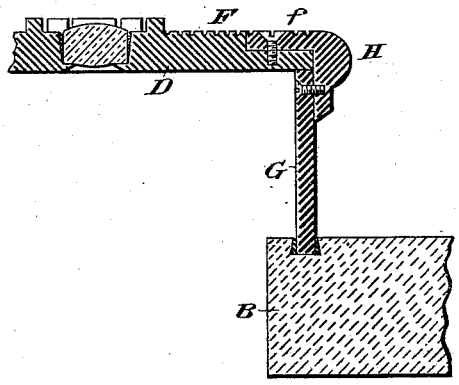


Fig. 5.



WITNESSES:

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Geo. Dawson

INVENTOR:

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Burke, Brown & Bonnell

(No Model.) 2 Sheets—Sheet 2.

J. K. INGALLS.

ILLUMINATING TILE.

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Fig. 4.

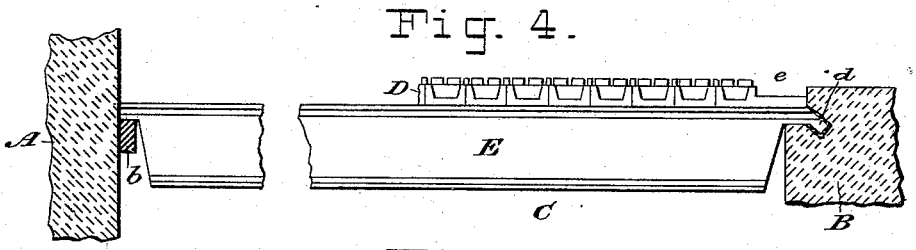


Fig. 6.

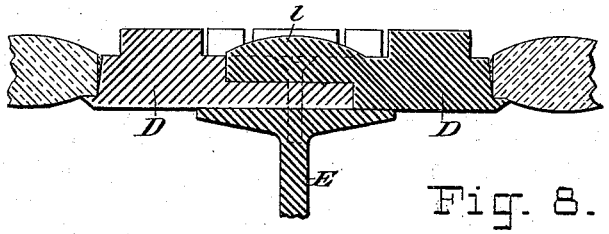


Fig. 8.

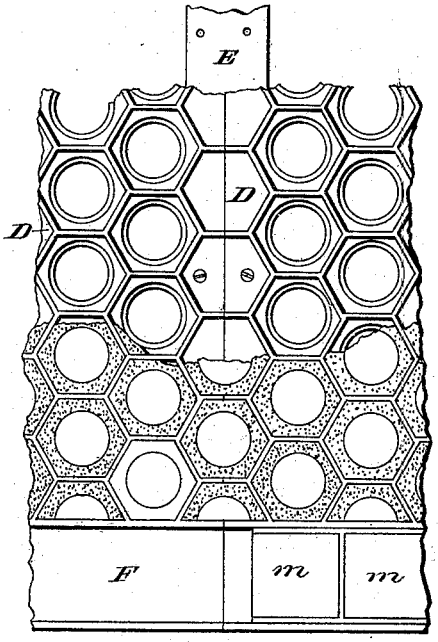


Fig. 7.

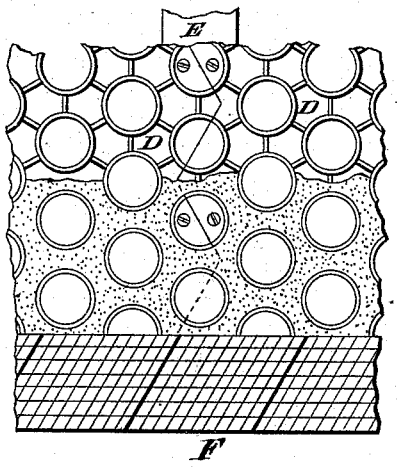
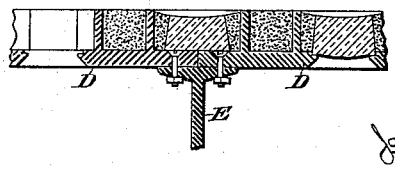


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOSHUA K. INGALLS, OF GLENORA, NEW YORK.

ILLUMINATING-TILE.

SPECIFICATION forming part of Letters Patent No. 261,720, dated July 25, 1882.

Application filed April 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA K. INGALLS, of Glenora, in the county of Yates and State of New York, have invented certain Improvements in Illuminating-Tiles, of which the following is a specification.

My invention relates to illuminating plates or tiles for sidewalks, vaults, areas, and other uses; and its object is to cheapen and simplify their construction and improve their appearance.

In the accompanying drawings, Figure 1 is a plan of a portion of a sidewalk laid with knob-tiles constructed according to my invention. Fig. 2 is an enlarged fragmentary cross-section thereof, cut along the line 2 2 in Fig. 1. Fig. 3 is a similar section, cut on the line 3 3 in Fig. 1. Fig. 4 is a sectional elevation of Fig. 1, cut along the line 4 4. Fig. 5 is a cross-section of a step constructed on the same principle. Fig. 6 is a view corresponding to Fig. 2, and showing a modification. Fig. 7 is a plan view similar to Fig. 1 of a portion of a concrete tile constructed according to my invention. Fig. 8 is a plan, on a larger scale, of another form of concrete tile; and Fig. 9 is a cross-section of Fig. 8, cut on the line 9 9.

Illuminating-tiles as now usually laid are set in a cast-iron frame fitted into the sidewalk or into the space or opening between the sidewalk and the building, and divided by cross-bars into panels or openings, into each of which one of the tiles or illuminating-plates is set and the joint around its edge made tight with cement. The frame has to be made especially to fit the place which it is to occupy. Its setting is a matter of considerable difficulty and expense, and the joints between it and the tiles are difficult to pack and continually liable to leak. Furthermore, the separate tiles, being isolated from each other by the intervening cross-bars of the frame, present a paneled or interrupted appearance. The diagonal lines presented by the lenses when viewed diagonally terminate at the edge of each tile, and are not taken up and continued by the next tile, but are there commenced anew from points intermediate of the lines on the first tile, thereby breaking up that harmonious continuity of surface and design which the eye naturally seeks.

The object of my invention is to overcome these defects of the present method of laying the tiles. To this end I dispense with the frame and lay the tiles directly in the space or opening to be covered over, making them large enough, when joined together, to fill that space, arranging them close together, edge to edge, and supporting them at intervals by cross-beams extending beneath the joints or seams formed by their meeting edges. Over these joints real or simulated lenses are placed, and the diagonal lines or rows of lenses continue across the joints without interruption. When a margin or border is desired to intervene between the illuminating portion of the plate and the edge of the opening in the sidewalk or other structure, the usual checkered or otherwise ornamented non-slipping border is cast on the edges of the tiles or on separate plates fastened into recesses therein, and the transverse joints are concealed by the formation at intervals of deep cross-grooves parallel with and simulating them.

An attempt has been made to obviate the disadvantage of the paneled appearance above referred to in a concrete tile by having adjoining sections meet over the cross-bar of the frame, arranging the border-rims back from the edges and far enough apart to receive a row of lenses between them, setting such lenses, and filling concrete around them; but this construction does not avoid the necessity of making a large frame to fit the opening to be covered, and in it the blind lenses over the seam are not confined in sockets, and hence are almost certain to become misplaced while running in the concrete, and it is entirely inapplicable to knob-tiles.

My invention is especially designed to render knob-tiles susceptible of being laid with an apparently continuous or uninterrupted illuminating-surface, but is also in part applicable to concrete tiles, applied to which it constitutes an improvement on the tile above described.

In Figs. 1 to 4 is shown a tile of the character known as the "elongated-knob" tile, consisting of a cast-iron plate having knobs formed to project from its upper surface between every two lens-sockets, to form an anti-slipping foothold. I show this form of plate be-

cause I consider it the best of the anti-slipping iron plates, not because it is essential to my invention.

Let A designate the wall of the building, B the sidewalk, and C the vault or opening to be bridged or covered over with the illuminating-tiling.

D D are two of the sections of tiling or illuminating-plate, shown as laid in place and partly broken away. I will describe this construction in detail.

Around the opening C a groove or rabbet, *a*, is cut in the stone of the sidewalk B, and against the wall of the building A a bar, *b*, is fastened. These are to provide ledges for the tiles to rest on, which ledges I shall refer to by the letter *c*. The ledge on the building might be formed in the masonry, or that on the stone might be formed by fastening on a plate or bar, or by an extension upward from the supporting-girder, or otherwise, as circumstances may dictate.

E E are cross-beams or girders extending across the opening C, and which will be one or more in number, according to the size of the opening. The back end of each is fastened to or against the building by being set into the masonry, or by being cut out, as shown in Fig. 4, and resting on the bar *b*, or in an indentation therein, so as to bring their top surfaces on a level. The front end of each girder is cut away, as shown in Fig. 4, and rests in a notch cut in the stone B deeper than the rabbet *a*, and it has a spur, *d*, projecting down diagonally into the stone, as indicated, and packed with lead, so that it is securely fastened down. These girders E E may be of wrought T or I beam, or they may be cast.

The sections D D are two or more in number, and fit together edge to edge, the joints or seams formed by their meeting edges coming directly over the girders E E. When fitted together they appear as one large tile which has been cut transversely at intervals into sections, are arranged equidistantly and in symmetrical order, preferably in the manner shown in Fig. 1, and the knobs are disposed uniformly around them. The lenses and knobs extend over the dividing-joints without interruption, so that the design appears continuous over the entire composite tile. Each dividing-joint is formed through the centers of the lens-sockets in the row which extends over the girder E, the top of the latter being made of such width as to intercept the light from only this one row of sockets. These divided sockets are formed with bottom webs, as shown in Fig. 2, which strengthen the edges of the plates and serve as flanges to bolt through in order to fasten the sections to the girders, as shown in Figs. 1 and 2. The dividing-joint extends in zigzag direction through these sockets, as shown in Fig. 1, whereby the cutting of the projecting knobs is avoided and the joint is rendered less apparent than if it were straight. Each plate or section D thus has alternate projections and indentations, which fit to and interlock with like projections and indentations in the edge of the adjoining section. The projecting portions of both plates extend beyond the center of the girder, so that a heavier weight on one plate than on the other is transmitted to both sides of the girder and has no tendency to tilt it, so that there is less likelihood of opening the joint and causing it to leak than if a straight joint were used. The sections D D are laid separately. Each is of such length as to extend across the opening C and rest on the ledges *c c*, to which it is fastened in any good way. For the fastening to the stone I have devised the method shown best in Fig. 3. The edge of the tile is notched at *g g*, Fig. 1, and opposite each notch a hole, *h*, is bored diagonally into the stone. Into this hole a pin or spike, *i*, is placed and packed with lead. Its head, which overhangs the edge of the plate D, is then battered or riveted down to make it confine the plate tightly. The sections D D are of two kinds—end sections and middle sections—both of which are shown in Fig. 1. The end section shown at the right is cast with a margin, F, on three edges—that is, on its two opposite ends and one side. This margin is here shown as being a recess, *e*, of a depth equal to about half the thickness of the section or plate D, as shown in Figs. 3 and 4, and of a width which may equal that of the usual checkered border of the frame heretofore used. This checkered border is then formed on separate thin plates *f f*, a series of which plates are laid in the recess *e* end to end, so as to break joints with the sections D, and are fastened down by screws. These plates serve to conceal the fastenings *g i*, as shown in Fig. 3. The middle sections, D, one of which is shown at the left in Fig. 1, have the margin F formed across only their ends, so that when laid these margins form continuations of those on the adjoining tiles. The plates *f* may be made the entire length of the margins around the composite tile, so that but one plate will be used for each of the four sides. The sections D D are laid and fastened down, as described. The joints between the sections and around the opening C are packed with cement or otherwise in any usual or good manner. The lenses are set in the sockets, including the blind sockets over the girders, and the border-plates *f f* are applied.

Fig. 5 shows a step, the plate D forming the tread, and a vertical plate, G, forming the riser. The two are united by an angle-plate, H, the upper portion of which forms the checked anti-slipping plate *f*, before described. I have shown this plate *f* as extending back but half the width of the border, the remainder of the latter being formed on the surface of the plate D. The angle-plate H is cast with the usual nosing, and is connected to the plates D and G by screws or bolts.

Instead of making the seams or joints between the separate plates D D by simply bring-

ing their edges together, their edges may be made to overlap, as shown in Fig. 6. I have here shown the upper laps as formed with convex projections *l*, one of which is shown in section to simulate lenses, instead of setting glass lenses in blind sockets over the girder.

In Fig. 7 is shown a concrete light with a checkered iron border, the latter being cast in one piece with the iron plate of the tile. The plates are united by a zigzag joint, as in Fig. 1, and the border is crossed diagonally by the joint. To conceal this diagonal joint the border is crossed at intervals by diagonal grooves, as shown, extending parallel with the joint and cutting up the border into diamond-shaped spaces instead of squares.

Figs. 8 and 9 show a concrete light which exhibits some further modifications of my invention. The iron plate is cast with ribs projecting up on a level with or slightly above the tops of the lenses. These ribs are of honeycomb shape in plan, forming a number of hexagonal cells, in each of which a lens is placed. The lens is preferably considerably smaller than the cell, so that the intervening space may be filled with concrete or "beton" up to the level of the ribs, to form an anti-slipping foothold. The seam or joint is here shown as being a straight line extending over the center of the girder beneath. As but little of the iron plate is visible after the concrete is filled in, a straight seam answers nearly as well for this variety of light as a zigzag seam. The bottoms of the cells over the girder are closed to form flanges to bolt through, as in Fig. 1. When a concrete light of this character is to have a border I make the plate, as shown in Fig. 8, with a continuous recessed margin, F, into which may be set encaustic tiles *m m*, as shown, or which may be filled with cement. In either case the joint across the margin is concealed.

It will be understood that by fixing upon several standard widths for the opening C and keeping in stock a number of end and middle tiles, D D, of length to fit those widths, and by constructing the opening C to one of the widths, my tiles can be laid without necessarily casting them to order for each job. To make the tiles fit the length of the opening C, a portion may be cut off the width of one of the middle tiles, or one middle tile may be cast wider or narrower than the others.

My invention avoids the expense of the framing heretofore employed. It reduces the total length of the seams to less than one-half. It secures a greater area of lighting-surface, and it presents a more uniform and finished appearance from above. It also produces a stronger structure to the same weight, as the frame heretofore used is an element of weakness, being liable to rupture from blows where unprotected by the tiles.

I make no claim to anything claimed in the patent of W. J. Fryer, Jr., dated April 5, 1881, No. 239,607.

I claim as my invention—

1. The improved process of laying illuminating-plates which consists in forming a ledge, *c*, on opposite sides of the opening to be covered, setting cross-beams or girders E E transversely across said opening at intervals, laying sections D D of illuminating-plates, each of a length equaling the width of said opening, transversely across said opening, with their ends resting on said ledges, and with their meeting edges fitting together over said girders, whereby the girders are concealed and the edges of both plates are supported by them, substantially as set forth.

2. A composite illuminating-tile consisting of sections of illuminating-plate, each section forming an uninterrupted continuation of the illuminating-surface of the adjoining section, and having a length equaling the width of the opening to be covered, the several sections laid across said opening and fitted together edge to edge, in combination with supporting-girders extending across said opening beneath and in contact with the meeting edges of the illuminating-sections, thereby forming bearers for said edges, substantially as set forth.

3. The combination of a section of illuminating-plate formed with uniformly-distributed lens-sockets, and having on its edge a row of divided or incomplete sockets, with a second similar section adapted to meet the first edge to edge, and formed on its meeting edge with divided or incomplete sockets, coinciding with those on the edge of the first section, and adapted, when the two sections are fitted together, to form continuations of and to complete said sockets, thereby forming a row of sockets along the seam, and with a supporting-girder extending beneath said row of sockets and forming a bearer for the meeting edges of both sections, substantially as set forth.

4. A composite illuminating-tile consisting of sections of illuminating-plate provided with equidistant and symmetrically-arranged lens-sockets, set with lenses, and with upwardly-projecting anti-slipping knobs disposed around and between said sockets, the sections fitting together edge to edge, the lenses and knobs on one section forming an uninterrupted continuation of those on the adjoining section, and the line of separation between the sections extending through the plate and avoiding the knobs, whereby the seam or joint is rendered but slightly apparent, in combination with a supporting-girder extending beneath the said joint and forming a bearer for both meeting edges, substantially as set forth.

5. A composite illuminating-tile consising of sections of illuminating-plate fitting together edge to edge, each section provided with equidistant and symmetrically-arranged lens-sockets, and with upwardly-projecting anti-slipping knobs disposed around and between said sockets, and the lenses and knobs on each section forming an uninterrupted continuation of those on the adjoining section, and the line of separation between each two sections ex-

tending through and dividing the lens-sockets of one row and avoiding the projecting knobs, in combination with a supporting-girder arranged beneath said row of sockets, and with blind lenses set in said sockets, substantially as set forth.

6. A composite illuminating-tile consisting of two or more illuminating-sections fitting together edge to edge, the line of their junction extending diagonally back and forth in zigzag direction through a row of lens-sockets, substantially as shown, and for the purposes set forth.

7. The combination of an illuminating-section, D, having one or more sides formed in a zigzag outline, and provided with half-lens sockets on said zigzag side, said half-sockets having bottom webs, in combination with another like section having a zigzag edge fitting to and interlocking with that of the first section, substantially as set forth.

8. The combination of two or more illuminating-sections, D D, adapted to bridge an opening or vault, and to fit together edge to edge, with a margin, F, extending along the edge of the opening, cast or formed in one piece with the illuminating portion of the sections, and that on one section forming an uninterrupted continuation of that on the adjoining one, substantially as set forth.

9. The combination of two or more sections of illuminating-tiling adapted to be laid side by side and fitting together edge to edge, so as to produce a continuous illuminating-surface, and each formed with a margin, F, cast or made in one piece with the illuminating portion of the sections, so disposed that when the sections are laid together to form a composite tile the margin will extend around the outer edge thereof and surround the entire illuminating-surface, substantially as set forth.

10. The combination, with sectional illuminating-tiles formed to fit together edge to edge, and so produce a continuous illuminating-surface, of a sectional border of checkered or otherwise ornamented non-slipping surface, arranged to surround the illuminating-surface when the sections are laid together, and provided with deep grooves at intervals simulating and parallel with the joints between the sections, substantially as set forth.

11. The combination, with illuminating-sections D D, formed with a recessed margin, F, of sectional border-plates *f f*, having a checkered or other anti-slipping upper surface fitting into said recessed margin, substantially as set forth.

12. The combination, with plate or section D, of the fastening for confining it to the stone, consisting of diagonal hole *h* in the latter and pin or spike *i* set in said hole, and its head overhanging the edge of the plate, and with the border-plate *f* fastened over and concealing said pin, substantially as set forth.

13. The combination of stone B and girder E with spur *d* on the latter projecting diagonally downward into the stone, substantially as shown and described.

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

JOSHUA K. INGALLS.

Witnesses:
ARTHUR C. FRASER,
HENRY CONNETT.