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E. B. BAKER

2,216,220

LUMINOUS BRICK AND CONSTRUCTION COMPRISING THE SAME

Filed Aug. 25, 1937

Fig. 1.

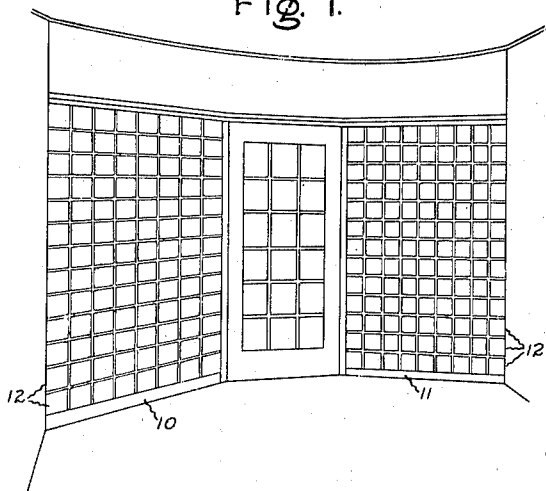


Fig. 2.

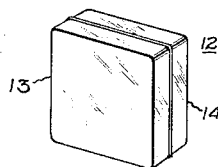


Fig. 3.

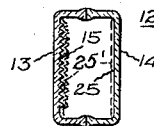


Fig. 4.

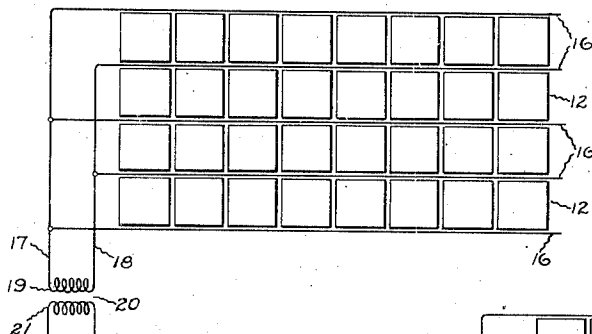


Fig. 6.

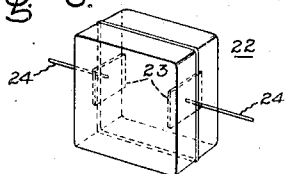


Fig. 5.

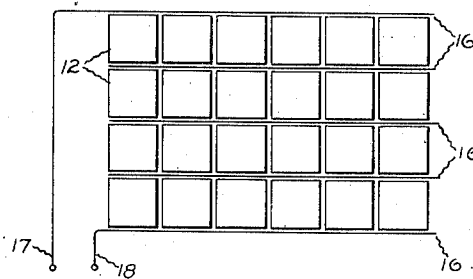
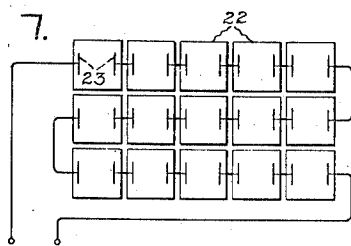


Fig. 7.



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UNITED STATES PATENT OFFICE

2,216,220

LUMINOUS BRICK AND CONSTRUCTION
COMPRISING THE SAME

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mesne assignments, to General Electric Com-
pany, a corporation of New York

Application August 25, 1937, Serial No. 160,852

6 Claims. (Cl. 240—1)

My invention relates to illumination generally and more particularly to self-luminous wall constructions.

According to my invention, walls are formed from hollow blocks of light-transmitting material, such as glass, containing means for rendering said blocks luminous upon passage of an electric current therethrough. The individual blocks may be filled with an ionizable gas or vapor or mixture thereof, suitable means being provided to excite the gas or vapor to luminescence. With a wall of this nature, the intensity of the light per unit of area is much lower than is the case with a few spaced light sources of high intensity and a closer approach to indirect illumination may be achieved. In a room having the walls (either side walls or ceiling) built up in this fashion, an adequate quantity of light may be obtained without having any bright spots to produce an annoying glare. Moreover, when used as an outside wall, a room of this nature would be quite adequately illuminated during the day due to the translucent nature of the wall. Another advantage of such a structure is that since the wall is itself luminous no separate light supporting devices need be provided. Moreover, since the internal pressure is quite low (on the order of 2 to 15 mm. of mercury, for example) each of the individual blocks functions as a very good heat insulator.

Walls constructed in accordance with my invention may also be made decorative, as, for example, by filling different blocks with different gases to produce various pleasing colored lighting effects.

Apart from purposes of illumination or decoration, such walls may also be made of glass transparent to ultra-violet rays where bacteriacidal action is desired, as, for example, in operating rooms, solaria or even in refrigerators. The blocks may in this case contain a small quantity of mercury.

Further features and advantages of my invention will appear from the following detailed description of species thereof.

In the drawing, Fig. 1 is a perspective view of a room having walls of the type comprising my invention; Figs. 2 and 3 are perspective and sectional views respectively of a glass block used in building up such a wall; Fig. 4 is a diagrammatic view of a portion of a wall illustrating one method of applying an electric current thereto; Fig. 5 is a similar view of a modified method of supplying current; Fig. 6 is a perspective view of a modified form of block containing internal elec-

trodes; and Fig. 7 shows one form of circuit for a wall formed of such blocks.

Referring to the drawing, the walls 10 and 11 of the room shown in Fig. 1 are built up of blocks 12 preferably of glass. Each of the blocks 12 (Figs. 2 and 3) may be made of two pressed glass dishes 13 and 14 fused together at their peripheries, although they may be made by blowing, if desired. When used in the construction of an outside wall, the surface (either outer or inner) of one face of the block 12 may be provided with light refracting media, such as prisms or facets 15 (Fig. 3) for diffusing the sunlight entering the room. Each of the blocks 12 may be filled with a suitable ionizable gas, such as neon or argon, at a pressure of the order of 2 to 15 mm. of mercury.

The blocks 12 are laid up to form a wall with a suitable binding material between the blocks, preferably one which is non-conducting to radio-frequency currents and non-hygroscopic. In the arrangement shown in Fig. 4, conducting metallic plates or sheets 16, preferably the same width as the blocks, extend between the horizontal rows of blocks to serve as electrodes and are embedded in the binding material. The said rows of blocks are in this instance electrically connected in multiple, alternate electrodes 16 being connected to conductors 17 and 18 respectively. The said conductors 17 and 18 are connected across the secondary 19 of a transformer 20, the primary 21 of which is connected to a suitable radio-frequency generator. Upon completion of the circuit, the flow of radio-frequency currents between alternate electrodes 16 and through the gas or gases within the blocks 12, causes the said gases to be excited to luminescence.

Fig. 5 illustrates an alternative method of connecting the blocks 12 in which only the outer two electrodes 16 are connected to the conductors 17 and 18, thereby connecting the rows of blocks in series-parallel relation, the conductors 17 and 18 being connected to a source of high-potential high-frequency current.

The block 22 shown in Fig. 6 has a pair of electrodes 23—23 sealed therein and connected to lead-in wires 24—24 extending through and sealed in the side walls of said block. The said electrodes 23—23 may have a coating of electron emissive material thereon, such as barium oxide. The blocks 22 may be filled with an ionizable gas such as neon or argon at a pressure of the order of 5 mm. of mercury and may also contain a small quantity of mercury. In the arrangement shown in Fig. 7, the blocks 22 are con-

ected in series and may be supplied with current from a constant current source of ordinary commercial frequencies and high potential. Other suitable circuits may of course be employed.

When connecting the blocks 22 in series, a cut-out may be provided across each of them to prevent all of the blocks from going out upon failure of one of them. The blocks 22 may also be excited by means of high frequency currents. The said blocks may also be connected in multiple if each is provided with a series resistance or inductance.

For use as a ceiling, the blocks 12 or 22 may be made somewhat flatter than shown in the drawing. Instead of building up the walls merely by employing a binding material or cement in the manner of constructing ordinary brick walls, a suitable frame may be provided to permit ready removal and replacement of the individual blocks. In addition to the light-diffusing prisms or lenses 15 (Fig. 3) on the outside wall of the block 12 (or 22) the inner surface 25 of the inside wall may be frosted. The said surface 25, or both surfaces 15 and 25, as indicated by the dotted lines 25', may be coated with a fluorescent material, such, for example, as zinc silicate, cadmium silicate or calcium tungstate, or mixtures thereof. The fluorescent material serves to further diffuse the sunlight in the daytime, and when the wall is illuminated at night, the fluorescent material is excited to luminescence by the discharge in the blocks.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A structural wall composed of brick-like hollow sealed blocks of light-transmitting material, an ionizable gaseous atmosphere within said blocks adapted to be rendered luminous upon passage of an electric current therethrough, said blocks each serving as the enclosure for the gaseous atmosphere therein, and current conductors for supplying electrical energy to said blocks, said conductors being arranged within the wall whereby both sides of said wall present a substantially smooth unobstructed surface.

2. A structural wall composed of brick-like hollow sealed blocks of light-transmitting material, an ionizable gaseous atmosphere within said blocks adapted to be rendered luminous upon passage of an electric current therethrough, said blocks each serving as the enclosure for the gaseous atmosphere therein, a coating of fluorescent material on the inner surfaces of said blocks, and current conductors for supplying electrical energy to said blocks, said conductors being arranged within the wall whereby both sides of said wall present a substantially smooth unobstructed surface.

3. A structural wall composed of brick-like hol-

low sealed blocks of light-transmitting material, an ionizable gaseous atmosphere within said blocks adapted to be rendered luminous upon passage of an electric current therethrough, said blocks each serving as the enclosure for the gaseous atmosphere therein, electrodes in said blocks for supporting an electric discharge, and current conductors for supplying electrical energy to said electrodes, said conductors being arranged within the wall whereby both sides of said wall present a substantially smooth unobstructed surface.

4. A structural wall composed of brick-like hollow sealed blocks of light-transmitting material, an ionizable gaseous atmosphere within said blocks adapted to be rendered luminous upon passage of an electric current therethrough, said blocks each serving as the enclosure for the gaseous atmosphere therein, current conductors for supplying electrical energy to said blocks, said conductors being arranged within the wall whereby both sides of said wall present a substantially smooth unobstructed surface, and means for supplying electrical energy of high frequencies to said blocks through said conductors to excite the gaseous atmosphere therein to luminescence.

5. A structural wall composed of rows of brick-like hollow sealed blocks, of light-transmitting material, an ionizable gaseous atmosphere within said blocks adapted to be rendered luminous upon passage of an electric current therethrough, said blocks each serving as the enclosure for the gaseous atmosphere therein, current conductors for supplying electrical energy to said blocks, said conductors being arranged within the wall whereby both sides of said wall present a substantially smooth unobstructed surface, and means for connecting alternate conductors to opposite sides of a source of high frequency currents to excite the gaseous atmosphere in said blocks to luminescence.

6. A structural wall composed of brick-like hollow sealed blocks of light-transmitting material, an ionizable gaseous atmosphere within said blocks adapted to be rendered luminous upon passage of an electric current therethrough, said blocks each serving as the enclosure for the gaseous atmosphere therein, the interior of said blocks being substantially wholly unobstructed for free transmission of light therethrough, current conductors for supplying electrical energy to said blocks, said conductors being arranged within the wall whereby both sides of said wall present a substantially smooth unobstructed surface, and means for supplying electrical energy of high frequencies to said blocks through said conductors to excite the gaseous atmosphere therein to luminescence.

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