July 29, 1958 H. B. VINCENT 2,844,998

GLASS BUILDING BLOCK HAVING LIGHT-DIRECTING PROPERTIES

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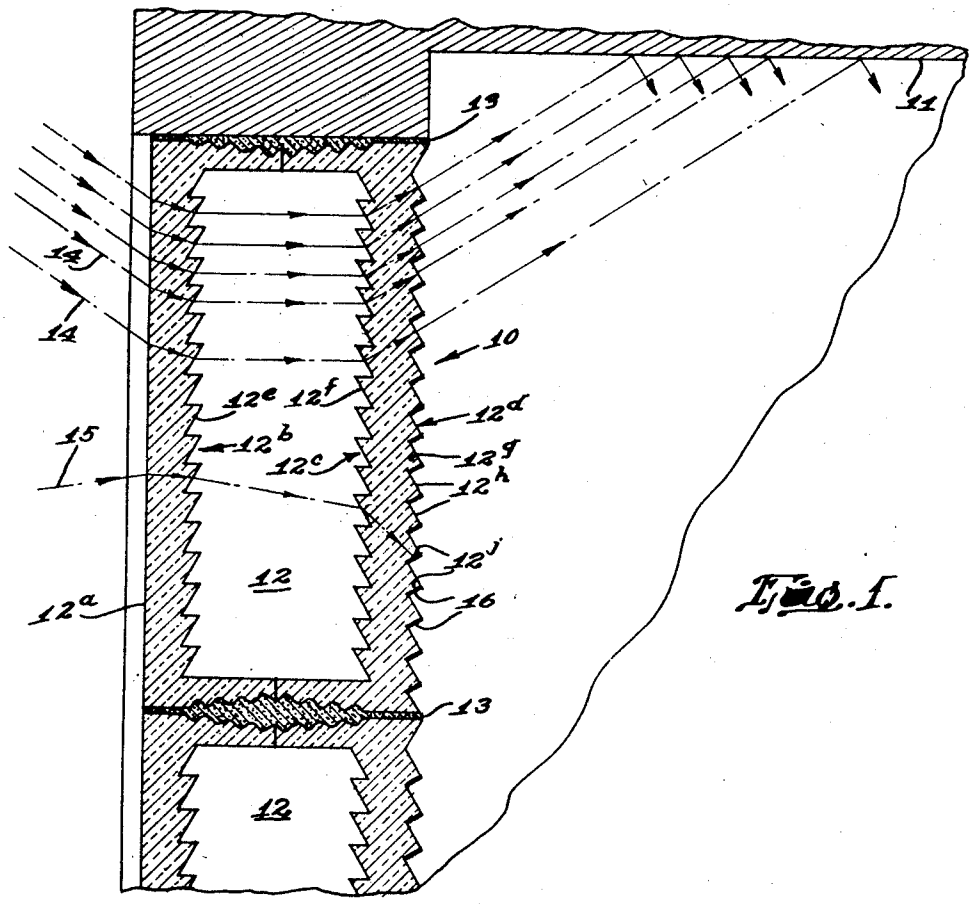


Fig. 1.

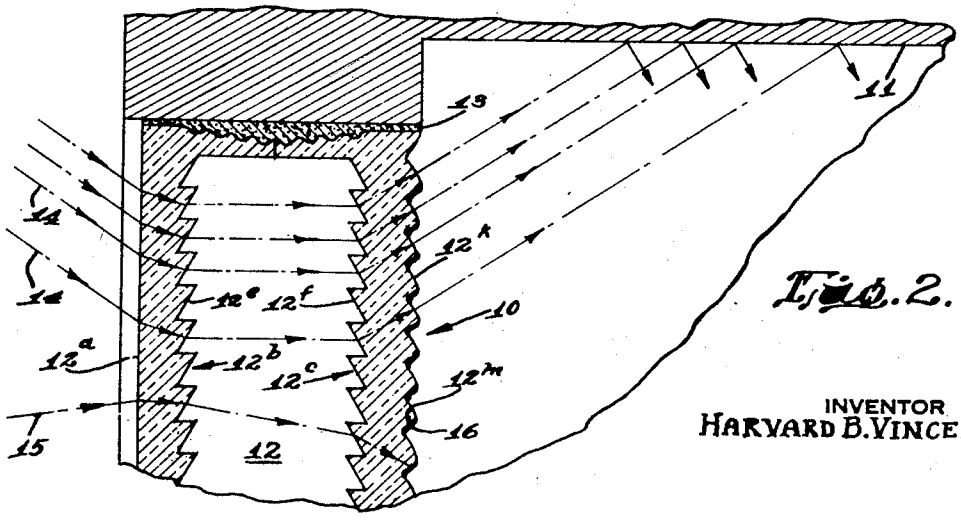


Fig. 2.

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GLASS BUILDING BLOCK HAVING LIGHT-DIRECTING PROPERTIES

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1 Claim. (Cl. 88—60)

This invention relates to improvements in transparent blocks of the type which have become increasingly popular in recent years for incorporation in the walls of buildings. More particularly, this invention relates to a hollow-glass block, of the type in which the internal faces of the hollow block embody horizontal prismatic flutings for deflecting incident sunlight in such manner as to cause a major part of the light to be directed throught the block and then upwardly toward the ceiling of the room where the block constitutes the outer wall.

It is a characteristic of these so-called "light-directing" glass blocks that a minor portion of the light passing through fails to follow the desired direction, but is transmitted into the room in a horizontal or downwardly directed path, which is quite undesirable from the standpoint of producing glare in the eyes of the room occupants. Additionally, during the hot summer season, an appreciable radiation of heat in the direction of the room occupants has been produced by the glass block wall constructions heretofore utilized.

It is an object of this invention to provide an improved transparent block for buildings, or the like, wherein the interior or room-adjacent surface of the block is fabricated in such manner as to substantially eliminate the transmission of any stray light in a direction tending to produce glare in the eyes of the room occupants without substantially reducing the overall light transmission through the block.

A further object of this invention is to provide an improved light-directing type of glass block for buildings, or the like, wherein the overall heat emissivity of a wall formed of such block is substantially reduced, and, additionally, the direction of heat radiation produced by such wall is substantially entirely toward the ceiling of the room, thus increasing the comfort of the room occupants.

The specific nature of this invention, as well as other objects and advantages thereof, will become apparent to those skilled in the art from the following detailed description, taken in conjunction with the annexed sheets of drawings on which, by way of preferred example only, are illustrated two embodiments of this invention.

On the drawings:

Figure 1 is a vertical sectional view taken through a wall of a room constructed with transparent block embodying this invention.

Figure 2 is a view similar to Figure 1 illustrating a modified construction of light-directing block embodying this invention.

As shown on the drawings:

Numeral **10** indicates a transparent external wall of a room having a light-reflecting ceiling **11**. Wall **10** is formed by assembly of a plurality of individual glass block units **12** in conventional fashion, such as by joining such block units by interspersed layers of mortar **13**. Each block unit **12** has an outer face **12***a*, a pair of opposed internal faces **12***b* and **12***c*, and an inner or room-adjacent face **12***d*. While the outer face **12***a* is illustrated as being of planar configuration, it may conceivably be

provided with vertically extending flutes to provide improved azimuth correcting properties in well-known fashion. The internal faces **12***b* and **12***c* are each provided with integrally formed, horizontally extending, vertically adjacent prismatic flutings **12***e* and **12***f* respectively. These flutings are arranged in conventional fashion so as to effect a redirecting of light rays received directly from the sun, indicated by the lines **14**, so that such light will be directed to the ceiling **11** of the room, thus illuminating the interior of the room solely by reflected light and protecting the occupant from the direct glare of the sun.

It often happens that ground reflected or other stray light, indicated by the ray **15**, enters the transparent blocks **12** at such angle so that, despite the bending action of the internal prismatic surfaces **12***e* and **12***f*, the light tends to enter the room along a horizontal or downwardly directed path, so as to produce a glare effect on the eyes of the occupant.

In accordance with this invention, all such horizontal or downwardly directed stray light may be effectively eliminated by providing the entire room-facing surface of the interior or room-adjacent wall **12***d* of the transparent block with a series of vertically adjacent horizontally extending prismatic elements **12***g*. Each prism **12***g* thus defines an upwardly directed surface **12***h* and a downwardly directed surface **12***j*. In accordance with this invention, each of the downwardly directed surfaces **12***j* is provided with an apaque coating **16** which substantially prevents the transmission of any light from such downwardly directed surfaces. Thus the stray light beam represented by the ray **15** cannot directly enter the room along either a horizontally or a downwardly directed path, but is reflected or absorbed back through the walls of the block so that it finally enters the room, if at all, along an upwardly directed path, passing out through one of the upwardly directed surfaces **12***h* of the interior wall **12***d*.

As a further feature of this invention, the apaque coating **16** applied to such downwardly facing surfaces **12***j* is preferably formed of an unoxidized metal. For example, aluminum, silver, copper or other polished metals would provide a suitable coating. Such coating is not only opaque, but has a heat emissivity factor substantially lower than that of glass. Accordingly, the total heat radiated into the room by the downwardly facing surfaces **12***j* will be substantially reduced, and since most of the heat radiation felt by the occupants of the room emanates from such downwardly facing surfaces, it is clear that the comfort of the occupant, so far as heat radiation is concerned, will be substantially improved.

It will, of course, be apparent to those skilled in the art that any form of prismatic surfaces may be employed on the interior side of the glass block, so long as the downwardly facing portion of such surfaces are provided with the apaque coating. Thus, in Figure 2 there is illustrated a modification of this invention, wherein the configuration of the prismatic surfaces on the interior wall of the block is represented by generally arcuate flutings, including upwardly facing portions **12***k* and downwardly facing portions **12***m*, to which the opaque coating **16** is again applied.

It will, of course, be understood that various details of construction or procedure may be modified through a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claim.

I claim:

A hollow glass building block comprising an outer face having an external surface adapted for exposure to a light source and an inner face interconnected to said outer face about the periphery of the block, said outer face and said inner face having opposed internal surfaces

in spaced relationship on which are respectively formed a multiplicity of cooperating light-directing prisms, said inner face additionally having an external room-facing surface similarly formed with light-directing prisms, said room-facing prisms providing alternate upwardly and downwardly facing surfaces adapted to cooperate with the prisms formed on the internal surfaces of both said faces to redirect substantially all of the incident light received upon the exterior surface of said outer face upwardly and outwardly from said inner face, a layer of opaque material covering said downwardly facing surface portions of said room-facing prisms to prevent outwardly and downwardly directed stray light transmission, said

opaque material having a heat emissivity factor substantially lower than the heat emissivity factor of said glass block to diminish outwardly and downwardly directed solar heat radiation.

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