

[54] BASEMENT WINDOW SHIELD

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[22] Filed: Nov. 3, 1972

[21] Appl. No.: 303,659

[30] Foreign Application Priority Data

Nov. 17, 1971 Germany..... 7143349

[52] U.S. Cl..... 52/107, 52/169

[51] Int. Cl..... E06b 5/02

[58] Field of Search ..... 52/107, 169, 201, 19, 3; D13/1 M

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[57] ABSTRACT

A prefabricated shield of thin wall construction adapted for attachment to a building wall at a level below grade in front of an aperture such as a basement window for admitting air and light thereto. The shield can be made of concrete, plastic or metal and has curvature in three dimensions so as to be subject substantially only to compressive forces. The shield has an open upper end on which a cover can optionally be placed, and it has a rear opening adapted to overlap the building wall aperture.

5 Claims, 7 Drawing Figures

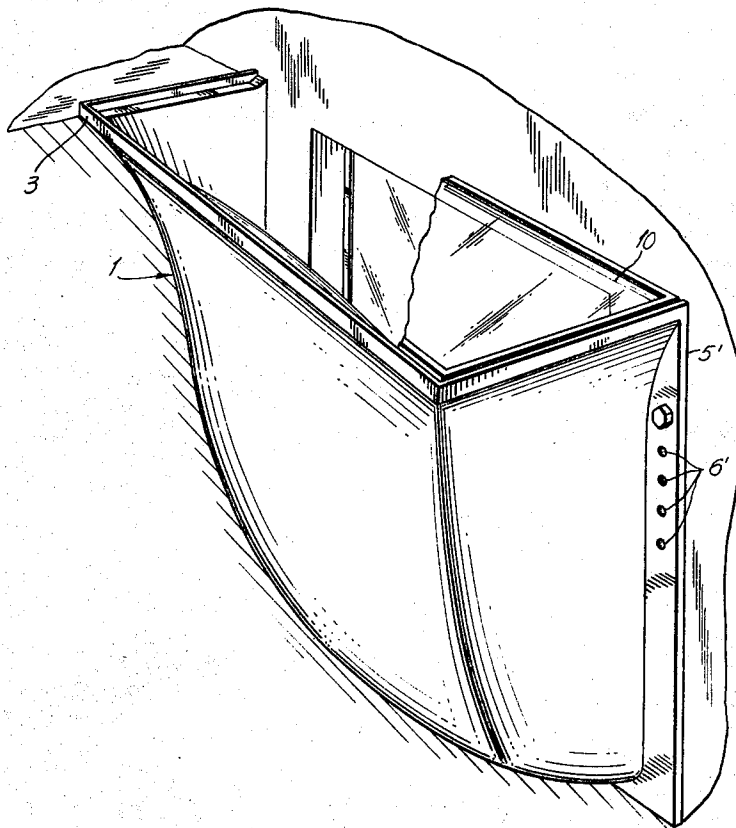


Fig. 1

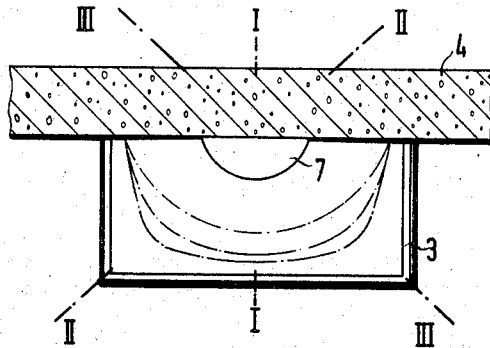


Fig. 2

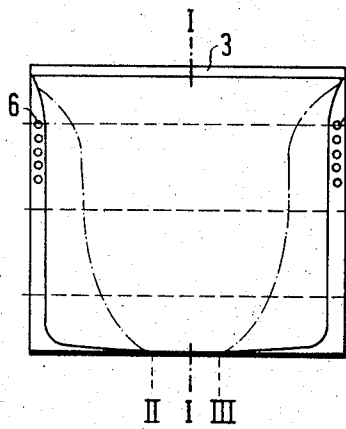


Fig. 3

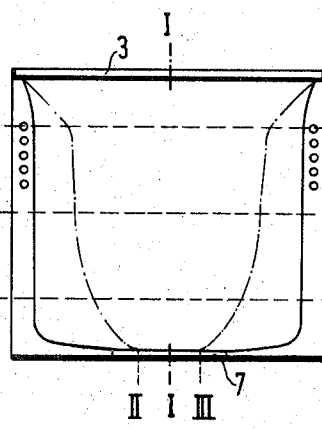


Fig. 4

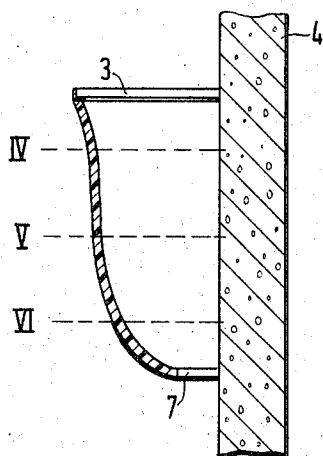


Fig. 5

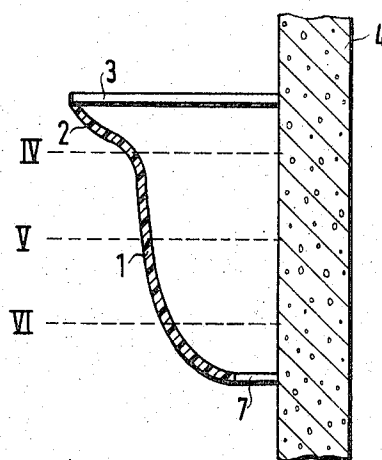


Fig. 6

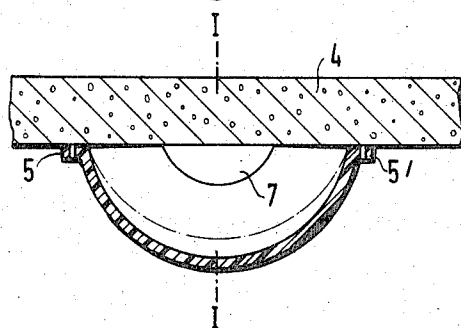
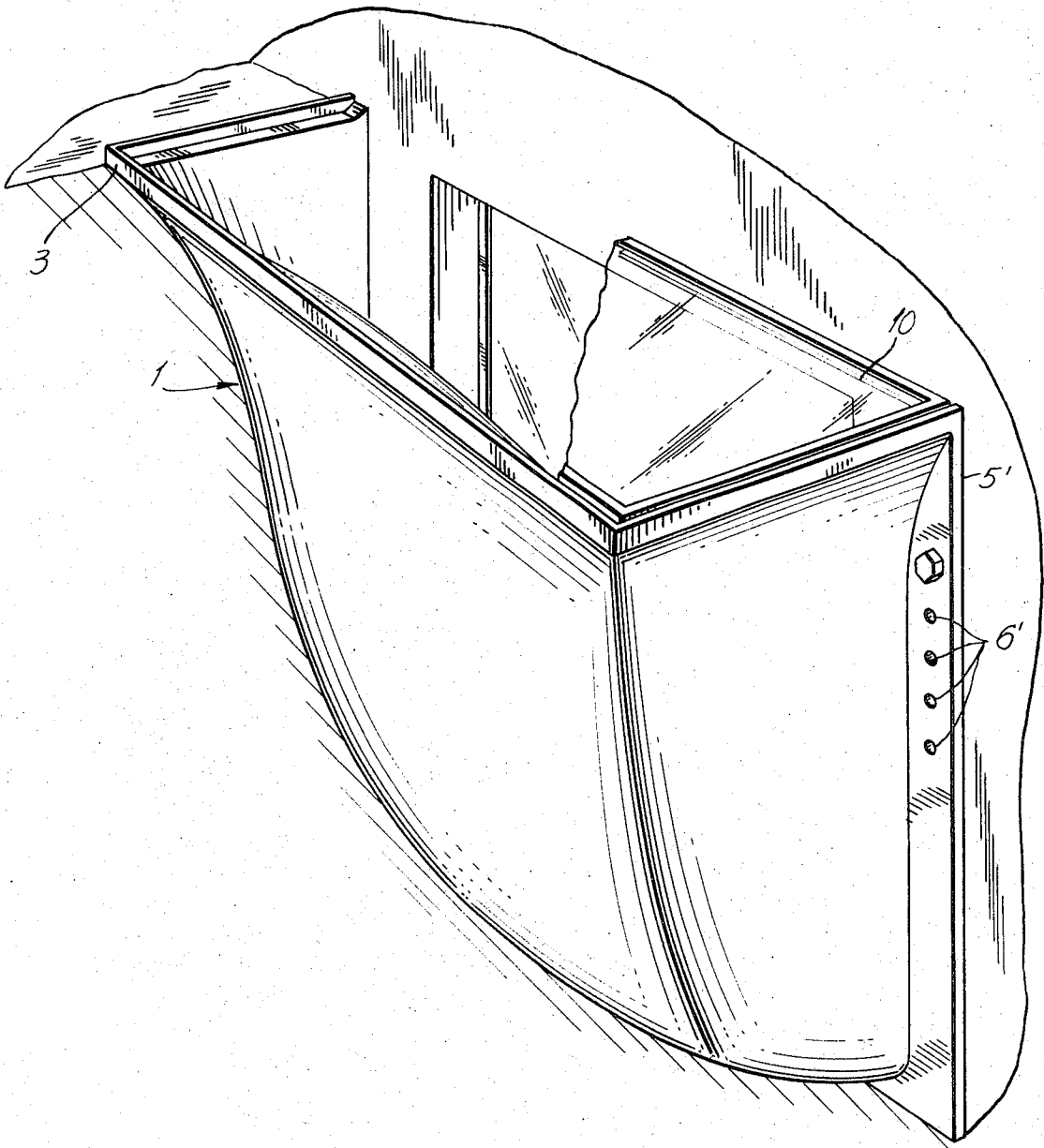


Fig.7



## BASEMENT WINDOW SHIELD

### BACKGROUND

#### a. Field of the Invention

The invention relates to a prefabricated shield or cover adapted for attachment to a building wall at a level below grade over an aperture such as a basement window to supply air and light thereto.

#### b. Prior Art

There are known shields of this type which consist of concrete or, recently, of plastic material, and they form a shaped body having at least three wall portions, namely an end wall remote from the building and a pair of laterally adjoining left and right transverse walls, respectively. An upper opening of the shaped body is either initially left open and a cover in the form of a screen or glass window or the like is subsequently affixed thereto, or the opening is closed, e.g., by being clamped or cemented at the place of manufacture of the shield. There are also known prefabricated shields having a bottom wall formed integrally therewith which are provided with drainage passages for water which enters the shield. Frequently, the bottom closure is constructed only after attachment of the shield to the building wall, e.g., in the form of a layer of coarse gravel.

Normally, such shield in the form of a three- or four-walled box shaped segment has a cubical basic configuration comprising walls extending normal to each other. However, there is also known a prefabricated shield whose front wall has a relatively small spacing from the building wall and extends upwardly and outwardly at an inclination so that the smooth inner surface thereof is capable of reflecting daylight from above into the basement window. The two approximately triangular transverse walls extend normal to the front wall, as seen in horizontal section.

Furthermore, there is known a ready-for-assembly so-called safety plastic shield having a steel mesh grid embedded therein and serving as a cover. The shield also has a bottom surface, which is used as a stepping or entrance shield for house entrances, for basement windows, as a water drainage trough for garage entrances and the like. This known construction is said to provide the advantages of reducing the danger of accidents because of the non-removability of the cover e.g., by children, and having low weight because of the use of plastic material as the basic material. A vertical sectional view through the shield shows a body having four side walls, two of which extend at an inclination inwardly towards the bottom surface. Thus, this known shield represents a trough having a cover attached thereto by clamping and it forms a relatively bulky shaped body.

Another conventional shield construction comprises an approximately semi-cylindrical wall portion with box portions adjacent the building which are recessed at the bottom in such way that they snugly fit the cellar window-sill and, additionally, cover the latter by means of a metallic shroud attached thereto. This provides a water-tight attachment to the building even if the surrounding ground happens to sink at a later time.

### SUMMARY OF THE INVENTION

An object of the present invention is to provide a shield having increased static strength so that it may be

formed of a thin wall thickness, of concrete, sheet metal or plastic material.

Accordingly, the invention in its broadest sense comprises a shield adapted to be attached to a building wall, for example, for basement windows and the like, in the form of a shaped body open at its upper end and at the side to be attached to the wall and characterized in that said shaped body is three-dimensionally curved.

Accordingly, the basic form of the novel shield is not cubical or semi-cylindrical as in the known constructions, but rather represents a sector of the periphery of a sphere, of an ovaloid or other body having a three-dimensionally curved surface. With this three-dimensional curvature, it is achieved that the wall of the shield in its operational condition, i.e., after attachment to the building wall and after surrounding or embedding with earth material, at substantially every point is subjected to compressive loads only and no flexural loads. This results in the great advantage that it is no longer necessary to impose severe requirements with respect to tension strength and flexural strength on the shield material as had to be done heretofore. Thus, for example in the case of concrete, substantially thinner wall thicknesses are sufficient, and, primarily, there may be used shaped bodies consisting of sheet metal, plastic material or plastic foam material, possibly with conventional fiberglass reinforcement.

Hereby, it is within the purport of the invention to avoid sharp edges sensitive to bending at the transition areas between the wall of the shield and an integral attaching flange having planar surfaces, i.e., adjacent the building wall and also at the support for the cover grid, and instead to form these portions with thick walls and/or of rounded or arcuate shape in outward direction.

Further, it is within the contemplation of the invention, to form the shield in such way that its side walls diverge from each other so that they contact the building wall at an obtuse angle when attached to such wall. This avoids undesired relative movement between the shield and the building by the pressure exerted by the earth material.

This diverging configuration of the side walls of the shield and, optionally, a flaring expansion of the upper portion of the shield as will be explained in greater detail later, provide the technical advantage that a plurality of shield may be stacked or nested one within the other, so that storing and transportation space is saved. The stackable or nestable construction of shields in general has already been proposed by the inventor and described in published German Application No. P 20 34 134.8.

In principle, the cover grid can be given a circular outline corresponding to the curvature in a horizontal section of the shield according to the invention. On the other hand, when using cover grids of usual configuration, e.g., of rectangular or trapezoidal shape, the shield is provided with a corresponding flaring taper in upward direction, whereby sharp edges and corners are replaced by three-dimensional curvatures in this case, too.

A modified embodiment of the invention consists in arranging the attaching flanges to the building wall within the major horizontal cross-section defined by the frame of the cover grid, i.e., to form the shield with correspondingly smaller dimensions under such grid frame. This makes it possible to place a plurality of

shields in side-by-side relation thereby providing a substantially uninterrupted series of cover grids. An arrangement of this type is advantageous for buildings whose basement rooms are to receive maximum light.

Basically, the attachment of the shield according to the invention may be effected with the aid of any desired conventional means, such as bolts or wall dowels, nails driven into the wall or the like. However, preferably the two attaching flanges are each provided with a series of several receiving holes in a sequence at equal levels, such as apertures or countersunk bores, each for one retainer stud which, in turn, is anchored within the wall of the building. This facilitates the vertical adjustment of the shield with respect to the floor level. The construction of a shield having a series of stud holes is generally the subject matter of a prior patent application of the inventor and described in published German Application No. P 20 34 134.8.

In the case of shields having small wall thickness, and particularly in the case of shields consisting of plastic material with solid or foamed consistency, the stiffness can be increased in conventional manner, e.g., by additional profiling and/or by the use of reinforcing inserts of metal, fiberglass or the like.

The present configuration of the shield with its continuously three-dimensionally curved outer wall results in a tapering basic form with the minor horizontal cross-sectional area being in the region of the bottom and, consequently, with the inner wall extending inwardly with inclination in downward direction. This configuration provides the advantage that light falling into the basement window is amplified by reflection from the inclined wall. Furthermore, the inner wall may be protected to a substantial degree against fouling by suitable selection of the wall material, e.g., by using plastic material having a smooth surface, and/or by using suitable protective coatings such as water-repellant and/or fungicide coatings.

The shield according to the invention may be made from known materials, such as heavy concrete, light concrete, plastic, plastic foam or metal.

#### BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view from above of a shield according to the invention with the cover grid removed;

FIG. 2 is a front elevation view of the shield of FIG. 1, as seen in the direction of the building wall;

FIG. 3 is a rear elevation view of the shield of FIG. 1, as seen from the building side;

FIG. 4 is a vertical sectional view of the shield as taken along line I—I in FIG. 1;

FIG. 5 is a vertical sectional view of the shield as taken along line II—II in FIG. 1;

FIG. 6 is a horizontal sectional view of the shield as taken along sectional plane V in any one of FIGS. 2-5; and

FIG. 7 is a perspective view of the shield installed in the ground and partly broken away to show its interior.

#### DETAILED DESCRIPTION

Referring to the drawing, therein is seen a shield 1 which is adapted for being attached to a building wall 4 at a level below grade, and in front of an aperture such as a basement window to allow air and light to enter the window.

The shield can be made of any suitable construction material such as concrete, plastic or metal and in the particular embodiment is a polyester bonded concrete.

As seen in the drawing and especially in FIG. 5, the side wall of the shield is curved upwardly and outwardly and has a flared upper portion 2 which merges into an upper end of rectangular shape. A rectangular frame 3 composed of angle members is mounted at the top of the sidewall of the shield, the angle members being made of rust resistant material such as zinc-plated iron sheet material or the like. The frame 3 can be embedded in the sidewall of the shield when the latter is made of concrete or plastic. A cover 10 (FIG. 7) of corresponding rectangular shape of frame 3 can be placed on the frame and optionally secured thereto.

The shield is three dimensionally curved and, for example, can have the shape of a portion of the surface of a sphere or ovaloid whereby when it is embedded in the earth it will be subjected mainly to compressive stresses and it therefore can have minimum thickness.

In order to appreciate the curved nature of the shield 1, various vertical and horizontal sections have been taken in the figures of the drawing and shown in dot-dash outline. Thus, in FIG. 1 there can be seen the various outlines of sections taken in planes IV, V and VI in FIGS. 2-5. The dot-dash lines in FIGS. 2 and 3 represent the vertical outline of the shield as seen in the vertical planes passing through lines II—II and III—III respectively in FIG. 1.

As it may be seen especially from FIG. 6, the wall of the shield at its rear face, i.e., the face to be attached to the building wall 4, merges on both sides with small curvature, into respective flanges 5, 5'. Each of said flanges has a planar surface for abutment against wall 4. Both flanges have a respective series of apertures 6, 6' each being positioned in pairs at the same level. These apertures serve to receive one retaining stud on each side of the shield. The two retaining studs are, in turn, anchored to the building wall 4 at a spacing corresponding to the lateral spacing of apertures 6, 6' and at the same level. The axes of the apertures and of the retaining studs may extend horizontally or, if desired, outwardly and upwardly with respect to the building wall 4. The shield thus can be mounted on the studs at an adjustable level depending on which of the apertures are placed on the studs. At the lowermost portion of the shield at a location adjacent the building, a recess 7 is formed serving as a drainage hole for rainwater and the like.

What is claimed is:

1. A prefabricated shield adapted for attachment to a building wall at a level below grade in front of an aperture in the wall to admit air and light thereto, said shield comprising a thin wall body having an open upper end and defining a rear opening adapted to overlap the aperture in the building wall, said upper end of the body being of quadrilateral shape, the remainder of said body depending from said upper end and being continuously curved in three dimensions over substantially its entire extent such that horizontal and vertical planes passing through said body form continuous curved lines of intersection therewith, whereby force applied to the surface of said body produces substantially only compressive stresses in the body with the absence of flexural stresses, the wall of the body flaring

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upwardly and outwardly to form a smooth transition with the quadrilateral shape of said upper end, said body comprising side flanges integral with the wall of the body, said side flanges having planar surfaces for attachment to said building wall, said side flanges being provided with respective lines of apertures, said side flanges being positioned within the horizontal confines of the quadrilateral shape of the upper end of the body.

2. A shield as claimed in claim 1 wherein said body has the shape of a portion of the surface of a sphere.

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3. A shield as claimed in claim 1 comprising a frame member embedded in said body and having a corresponding quadrilateral shape as the upper end of said body.

4. A shield as claimed in claim 1 wherein said body has a lower end with a drainage opening provided thereat.

5. A shield as claimed in claim 1 wherein said body has the shape of a portion of an ovaloid.

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