Sept. 12, 1967 R. L. JONES 3,340,553

MARINE FLOATS AND METHOD FOR MAKING SAME

Filed April 30, 1965 2 Sheets-Sheet 1

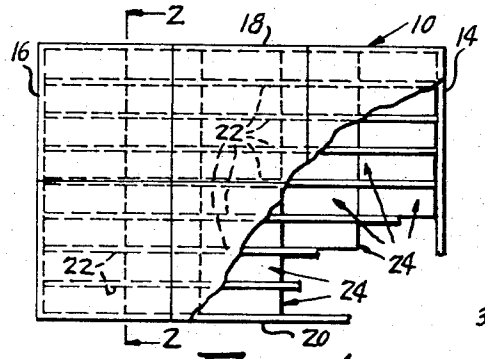


FIG. 1

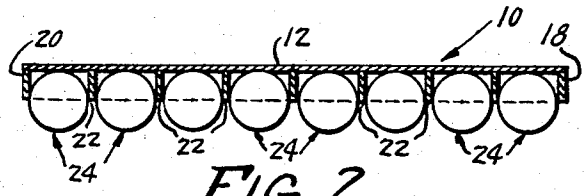


FIG. 2

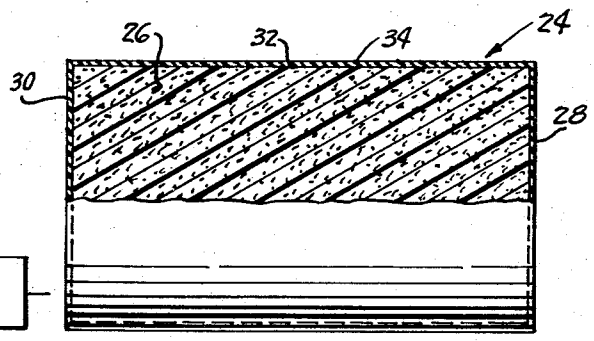


FIG. 3

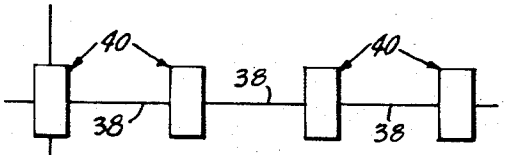


FIG. 4

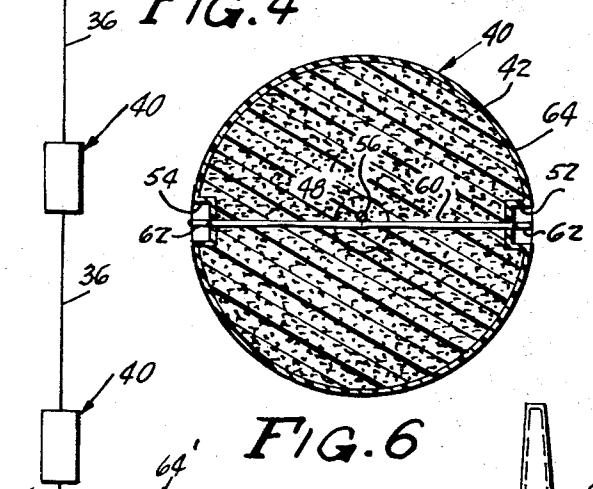


FIG. 6

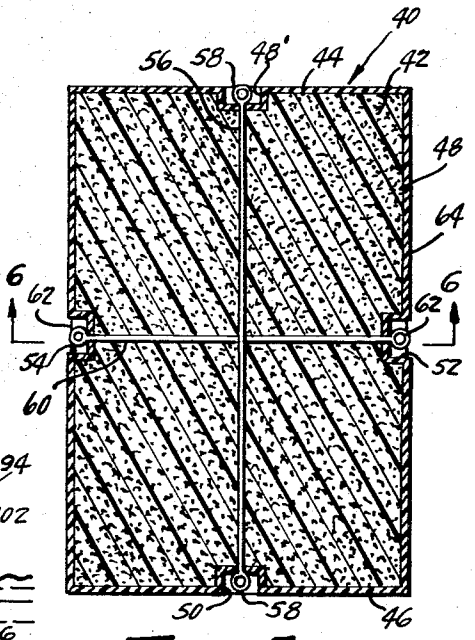


FIG. 5

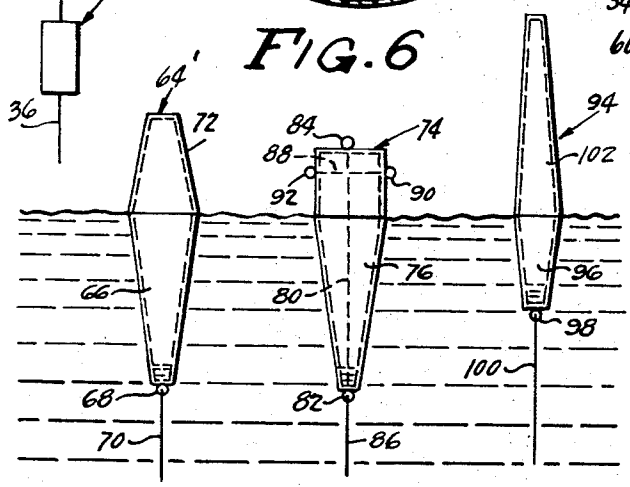


FIG. 7

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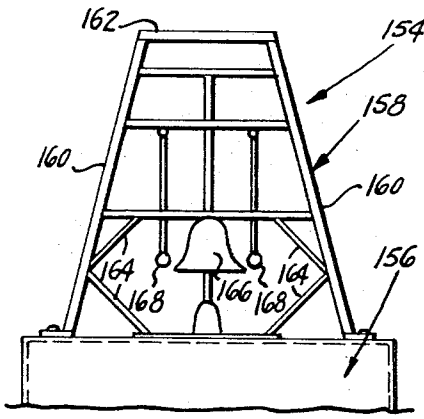


FIG. 11

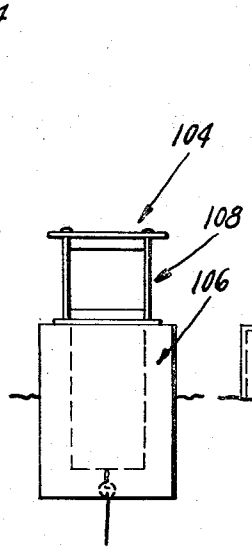


FIG. 8

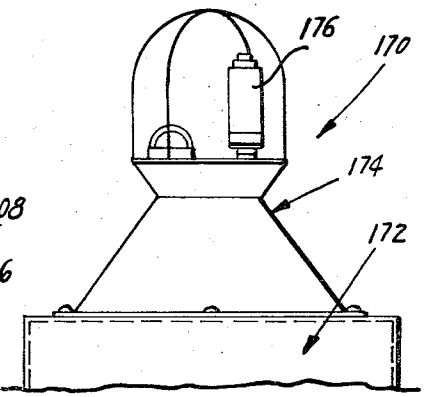
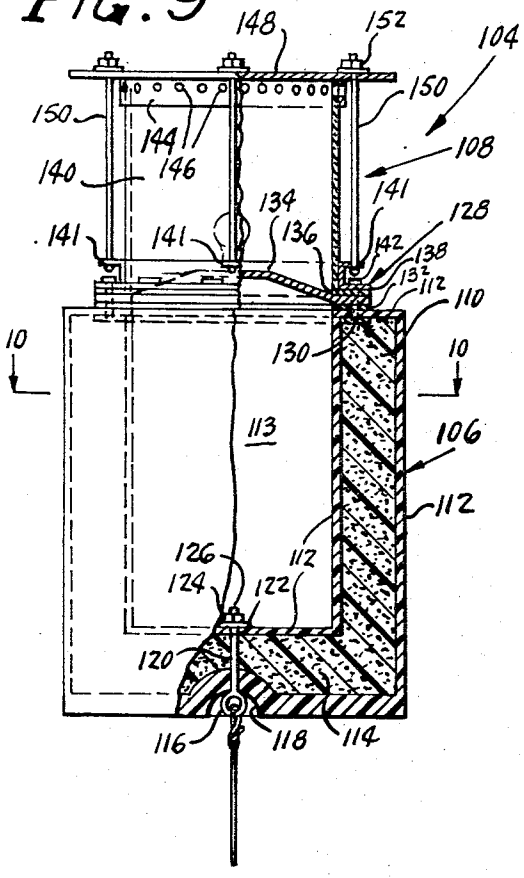


FIG. 12

FIG. 9



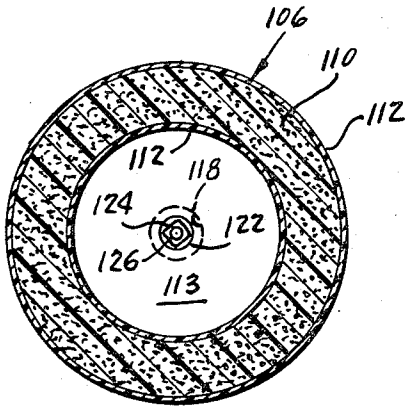


FIG. 10

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MARINE FLOATS AND METHOD FOR MAKING SAME

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10 Claims. (Cl. 9—8)

This invention relates to marine floats and method of making the same, and more particularly to masonry coated marine floats and buoys.

One object of the instant invention is to provide a marine float which is light in weight and inexpensive to produce.

Another object of this invention is to provide a marine float or buoy which is totally waterproof and airtight.

Another object of this invention is to provide a marine float or buoy which may be colored during manufacture to provide a permanently tinted float.

Another object of this invention is to provide a strong durable marine float which is chemically inert and which will not suffer from electrolytic decomposition.

It is another object of this invention to provide a method of making marine floats by spray coating a Styrofoam core with a masonry coating.

Another object of this invention is to provide a marine float having a Styrofoam core and a masonry coating with internal strengthening means.

Another object of this invention is to provide a method of making marine floats into any desired configuration.

Another object of this invention is to provide a marine float having a central well into which may be placed the operative mechanism for a signalling device.

Other objects and advantages of this invention reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawings wherein there are shown preferred embodiments of this inventive concept.

In the drawings:

FIGURE 1 is a plan view of a raft which utilizes marine floats in accordance with the principles of the instant invention, certain parts being broken away for clarity of illustration;

FIGURE 2 is a transverse sectional view taken along line 2—2 of FIGURE 1 and viewing in the direction of the arrows;

FIGURE 3 is a partial sectional view of the marine float shown in FIGURE 2;

FIGURE 4 ls a schematic view showing a number of the floats of FIGURE 3 being used to cordon off an area of a water body;

FIGURE 5 is a sectional view of another float made in accordance with the instant invention;

FIGURE 6 is a transverse sectional view of the embodiment shown in FIGURE 5, taken along line 6—6 and viewing in the direction of the arrows;

FIGURE 7 is a view showing a plurality of marine floats of varying configurations, all of the floats being made in accordance with the principles of the instant invention;

FIGURE 8 is an embodiment of a marine buoy which is adapted to carry a signalling means;

FIGURE 9 is an enlarged partially sectioned view of the device of FIGURE 8;

FIGURE 10 is a cross sectional view of the device of FIGURES 8 and 9 taken along the line 10—10 of FIGURE 9 and viewing in the direction of the arrows;

FIGURE 11 is a larger marine buoy of similar lower configuration to the embodiment of FIGURES 8 to 10, and having a gong type alarm on the upper surface thereof; and

FIGURE 12 is another embodiment of a marine buoy having a similar lower configuration and having a whistle or horn type alarm on the upper end thereof.

Referring now to the drawings in detail, wherein like reference characters indicate like elements throughout the several views thereof, there is indicated generally at 10 a raft comprising an upper planar surface 12 which is customarily rectangular in configuration and bounded by fore and aft depending flanges 14, 16 and lateral depending flanges 18, 20.

Referring now to FIGURE 2, a series of depending slats 22 divide the under surface of float 10 into a series of elongated stalls into which are positioned a plurality of marine floats indicated generally at 24. Any suitable means may be provided to secure floats 24 in the stalls provided by depending flanges 18, 20 and depending ridges 22.

Referring now to FIGURE 3, float 24 comprises an interior cylindrical or rectangular Styrofoam or polystyrene core 26 having upper and lower planar surfaces 28, 30 and a peripheral surface 32. The outer surface 34 of float 24 is a masonry coating which is applied as more fully explained hereinafter.

It has been found particularly advantageous to utilize a masonry compound composed of white Portland cement and graded silica sand in ratios of between one part cement to three parts sand to one part cement to four parts sand and additives in accordance with the following table:

Table I

Component:	Amount, pounds (per cubic yard of masonry compound)
Berylex	1–2
Expanded pumicite	15–37

It has been found that a marine float or buoy sprayed with a masonry compound in accordance with the above formulation provides an unusually strong waterproof surface. In addition it has been found that in spraying a core of Styrofoam or polystyrene there is substantially 100% adhesion of the sprayed compound to the core. Such excellent adhesive properties of the core and the sprayed compound precludes extensive "rebound" of the expensive formulation.

In addition to the previously indicated ingredients, calcium chloride may be added to the mix in amounts of 1–2 pounds per 100 pounds of composition to regulate the curing time of the sprayed cement. Likewise a liquid additive will be added in a proportion necessary to achieve the desired texture. A coloring pigment may be added to achieve a readily visible buoy which requires no repainting during the life thereof.

After the masonry compound is prepared, a suitable Styrofoam core is selected and placed vertically on lower surface 30. The masonry compound so prepared is placed in a masonry spray gun, such as may be purchased from the Refractall Manufacturing Company, of Tulsa, Okla. Upper surface 28 and peripheral surface 32 are then spray coated using the nozzle of the spray gun to direct the flow of the masonry compound. After this applied surface has set to the extent that float 24 may be handled, the cylindrical body is turned upside-down with surface 28 resting on the working area with surface 30 then being coated as previously mentioned.

Another marine float indicated generally at 40 is shown in FIGURES 5 and 6 and comprises a central cylindrical Styrofoam or polystyrene core 42 having upper and lower planar surfaces 44, 46 and a peripheral cylindrical wall 48. Each of walls 44 and 46 has an indentation 48, 50 substantially coaxial with the longitudinal axis of cylindrical core 42. Wall 48 has two indentations 52, 54 which are

placed on a diameter of cylindrical core **42** approximately midway through the length thereof. A longitudinal strengthening rod **56** extends between indentations **48, 50** and is provided with an eye **58** at each end. A transverse strengthening rod **60** extends between indentations **52, 54** and is likewise provided with an eye **62** on each end. Float **40** is covered with a masonry coating **64** which provides a high strength, hard durable covering. As shown in FIGURE 6 provisions are made so that longitudinal strengthening rod **56** does not interfere with transverse rod **60**, as by positioning rod **56** slightly removed from the axis of cylindrical core **42** or by providing a centrally disposed bent portion which straddles rod **60**.

In the construction of float **40** rods **56, 60** are preferably formed without eyes **58, 62** and are placed in a mold into which is poured the raw materials necessary to form core **42**. The mold is so formed as to produce indentations **48, 50, 52, 54** with the extreme ends of rods **56, 60** extending thereinto. After the core has hardened it is removed for further assembly steps. A suitable protective covering is placed on the exposed ends of rods **56, 60** after which masonry coating **64** is applied as previously discussed. Eyes **58, 62** may then be secured to rods **56, 60** by any suitable manner, such as by welding or by threaded connections which may be peened.

Alternatively, float **40** may be constructed by selecting a cylindrical Styrofoam core and cutting indentations **48, 50, 52, 54** therein with a knife or the like. Rods **56, 60**, with at least one end being formed without an eye may then be inserted into an indentation and pushed through Styrofoam core **42** exiting in the oppositely placed indentation. A suitable protective device is placed on the exposed ends of rods **56, 60** after which masonry coating **64** is applied as previously discussed. The additional eye may be secured to either of the rods as previously mentioned.

It should be noted that in this embodiment of the invention, eyes **58, 62** are positioned with their outermost extremity disposed inwardly of the outer edge of coating **64**, to preclude the eyes being broken off during rough treatment or handling.

Another mode of utilizing marine float **40** is shown in FIGURE 4 where a series of cords, cables or the like **36** connect the planar ends of float **24** and a similar series of cables **38** connects another group of floats **34** so that an area of water may be cordoned off to establish a safe swimming area which may be readily observed by a lifeguard.

Referring now to FIGURE 7 there is indicated generally at **64'** a nun-type navigational buoy comprising a lower frusto-conical shaped section **66** to which is secured a depending eye **68** carrying a cable **70** which may be secured to any convenient anchoring means (not shown). Buoy **64'** also comprises a relatively shorter upper frusto-conical shaped section **72** with the enlarged edges of frusto-conical sections **66, 72** abutting. In the manufacture of such a buoy, a Styrofoam core is molded to the opposed double frusto-conical shape shown with a masonry coating sprayed thereon.

Also shown in FIGURE 7 is a can-type navigational buoy indicated generally at **74** comprising a lower frusto-conical shaped section **76** and an upper cylindrical shaped section **78**. A longitudinal strengthening rod **80** is provided carrying eyes **82, 84** to which may be secured a cable or the like as shown at **86**. A transverse strengthening rod **88** is provided which extends through the cylindrical upper section **78** and which carries eyes **90, 92** so that a series of such buoys may be secured together above the surface of the water in much the same manner as floats **24** are secured as shown in FIGURE 4.

Also shown in FIGURE 7 is a spar-type marine buoy indicated generally at **94**, comprising a short lower frusto-conical shaped section **96** to which is dependingly secured an eye **98** carrying a cable **100** for attachment to an anchoring (not shown). The upper section spar-type buoy **94** comprises an elongated frusto-conical shaped core **102**. Buoy **94** may be conveniently made in the manner previously indicated.

Referring now to FIGURES 8 to 10, inclusive, there is indicated generally at **104** a marine buoy which is adapted to carry a signal light. Buoy **104** comprises a lower cylindrical masonry covered float **106** and an upper light housing **108**. Float **106** comprises a cylindrical Styrofoam or polystyrene core **110** having a blind aperture **113** in the upper end thereof. The exterior surfaces of Styrofoam core **110** carry a masonry coating **112** which may be of any desired thickness, but which is substantially thicker at the lower end thereof as shown at **114**. An eye **116** is secured in an indentation **118** in lower wall **114** by any conventional means, such as by a shank **120** which extends through lower wall **114**, core **110**, and inner wall **112** and which is secured thereto by a washer **122** and a threaded nut and bolt **124, 126**.

Securing light housing **108** to float **106** is an attachment means indicated generally at **128** comprising an annular ring **130** having a series of circumferentially spaced threaded openings and located beneath wall **112** as more fully explained hereinafter.

In the construction of float **106**, core **110** is molded to the desired configuration, which includes an indentation surrounding blind aperture **113** for the reception of annular ring **130**, and an axial indentation on the outer planar surface of core **110** so that eye **116** may be positioned as shown in FIGURE 9. As previously mentioned the masonry compound is prepared with core **110** being vertically placed on a suitable working area. Annular ring **130** is placed in the appropriate indentation with a grease covered threaded bolt being placed in each of the threaded apertures of ring **130**. A grease covered shank is placed so that it extends upwardly through the hole which corresponds to the position of shank **120**.

The outer surfaces of core **110** are then sprayed with the masonry compound to provide exterior walls **112**. After the walls **112** have initially set, the greased bolts which were inserted into the threaded openings of annular ring **130** are removed and float **106** is turned upside-down with thickened layer **114** being similarly applied. The grease covered shank is then removed with eye **116**, shank **120** being inserted in place thereof. Light housing **108** is assembled with bolts **142** replacing the previously removed grease covered bolts and engaging the threaded openings in annular ring **130**.

Light housing **108** may be of any desired type, but is shown as comprising a waterproof seal **132** having a series of circumferentially spaced openings, a cover plate **134** having a similar series of openings, and a second waterproof seal **136**. Positioned above second waterproof seal is a lower shield frame **138** having a series of peripherally spaced openings and a glass light shield **140** secured to shield frame **138** by any suitable means. Shield frame **138** carries a series of outwardly extending hooks **141** for purposes hereinafter more fully explained.

As shown in FIGURE 9 a bolt **142** is used to align the openings of shield frame **138**, second waterproof seal **136**, cover plate **134**, and first waterproof seal **132** for engagement with the threaded openings of annular ring **130**. Secured to the upper portion of glass light shield **140** is a hooded top **144** having a series of radial circumferentially spaced openings **146** which provide a vent means for the escape of combustion materials within housing **108**. Secured to the upper peripheral edge of hooded top **144** is a roof **148** of transluscent or transparent material.

A series of hook bolts **150** are secured as by threaded nuts **152** to the extending edge roof **148**, the lower end of hook bolt **150** being provided with a means to engage outwardly extending flange **141**.

As should be apparent from the previous paragraphs the threaded bolt **142** secures the annular members to float **106** with the glass shield **140** being attached to lower

shield frame **138**. Roof **148** and hooded top **144** are secured to shield **140** by bolts **150** in cooperation with flange **141** and nut **152**.

Any suitable lighting device may be placed in float **104**, such as an automatic electric lamp. The bulb of the lamp would extend through cover plate **134** with the necessary battery and wiring being conveniently held in blind aperture **113**. A light sensitive switch may be installed on buoy **104** to actuate a lamp only during hours of darkness.

Alternatively a gas operated or kerosene operated light could be provided with the burner portion extending through the center of cover plate **134**. The necessary gas supply tank could be conveniently housed in blind aperture **113**. It has been found that with a kerosene operated lamp, fuel may be placed in blind aperture **113** without the necessity of a tank or of special preparation of inner wall **112**. In order that the gas or kerosene flame burns only during hours of darkness, a light sensitive switch may be installed in a battery powered circuit to actuate an electric lighter.

FIGURE 11 shows a much larger navigational buoy indicated generally at **154** comprising a lower float section indicated generally at **156** and an upper framework shown generally at **158**. Lower float section **156** is of similar configuration to float **106** providing a blind aperture. Framework section **158** comprises a series of converging braces **160** secured by any convenient means to float **156**, braces **160** being spaced apart by a series of parallel braces **162** and diagonal supports **164**. Disposed centrally of framework **158** is an electrically operated bell **166** and a pair of stationary clappers **168**. Bell **166** is conveniently pivotally mounted such that the oscillation thereof will contact clappers **168** thus providing an audible alarm. A battery and other necessary electrical equipment needed to operate bell **166** is housed in the blind aperture.

Shown in FIGURE 12 is another navigational buoy indicated generally at **170** comprising a lower float section shown generally at **172** and an upper alarm housing indicated generally at **174**. Float **172** is made in a similar manner to floats **156** and **106**. Alarm housing **174** houses a suitable whistle or horn **176** with the necessary electrical equipment being housed in a blind aperture in float **172**.

From the foregoing it will now be seen that there is herein provided an improved marine float and method of making the same, which accomplishes all of the objects of this invention and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of the inventive concept, and since many modifications may be made in the embodiments hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. A marine float comprising a substantially cylindrical inner core having a longitudinal axis and dimension, a diameter, and an exterior surface, said core having a centrally disposed blind aperture with an inwardly facing wall therein; said exterior surface and said inwardly facing wall carrying a spray coated masonry surface, and an annular ring having peripherally spaced threaded apertures positioned adjacent said blind aperture between said core and said masonry surface, said masonry surface having a plurality of openings coaxial with and immediately above said threaded apertures of said annular ring.

2. The structure of claim **1** wherein said masonry surface comprises white Portland cement and graded silica sand in a ratio between one part cement to three parts sand and one part cement to four parts sand, between one to two pounds of Berylex per cubic yard of masonry compound and between 15 to 37 pounds of expanded pumicite per cubic yard of masonry compound.

3. The structure of claim **1** wherein said core is of Styrofoam.

4. The structure of claim **1** wherein said core is of polystyrene.

5. The structure of claim **1** wherein said ring supports an annular transparent light housing, and a light in said housing.

6. The structure of claim **5** wherein said light housing has a translucent roof.

7. The structure of claim **1** wherein said ring supports an electrically operated bell.

8. The structure of claim **1** wherein said ring supports an alarm whistle.

9. The method of forming a marine float comprising the steps of selecting a core made of a material chosen from the group consisting of Styrofoam and polystyrene and having a centrally disposed blind aperture, selecting an annular ring having a series of peripherally spaced threaded openings, placing said annular ring on the upper end of said core coaxial with said blind aperture, threadably securing a series of bolts in each of said threaded openings, grease coating the upper ends of said bolts, and spraying a masonry compound on the external surfaces of said core.

10. The method of claim **9** including the further steps of permitting said masonry compound to dry, removing said grease coated bolts, and securing an alarm housing to said ring by additional bolts.

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