July 8, 1952 N. POLIKOFF 2,602,846

ELECTRIC ALARM APPARATUS FOR BATHTUBS

Filed April 12, 1949 2 SHEETS—SHEET 1

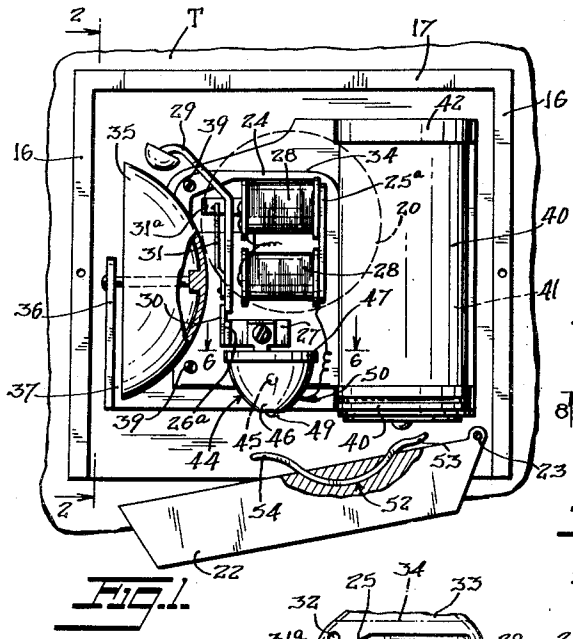


FIG. 1.

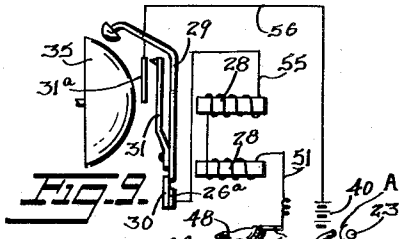


FIG. 9.

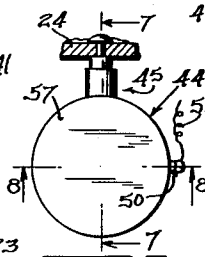


FIG. 6.

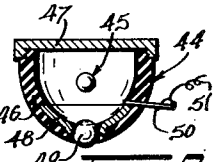


FIG. 8.

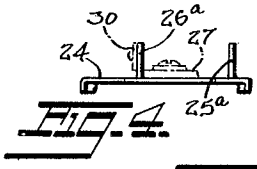


FIG. 4.

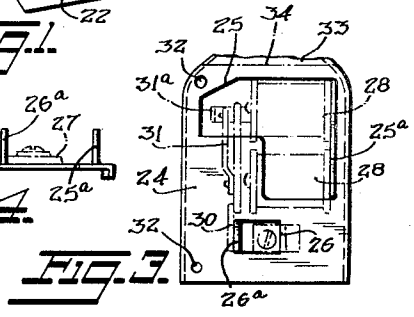


FIG. 3.

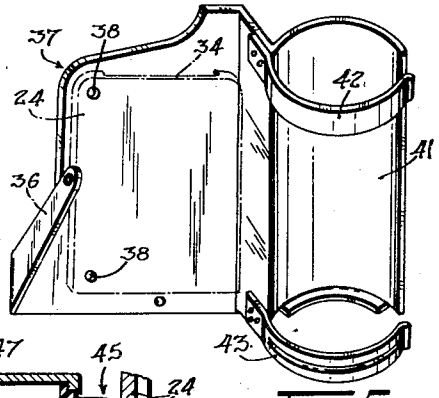


FIG. 5.

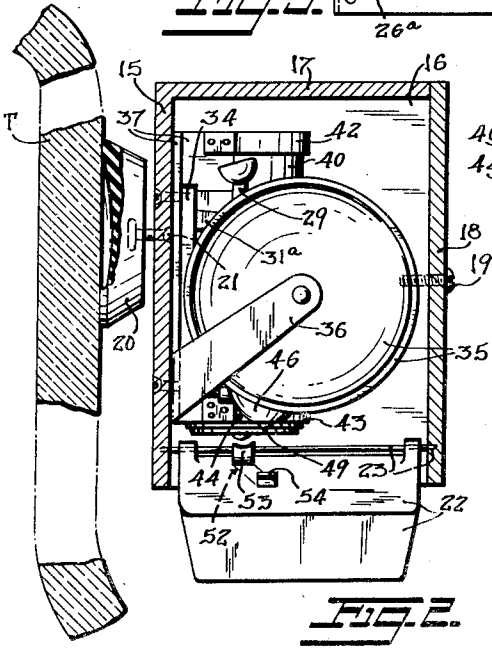


FIG. 2.

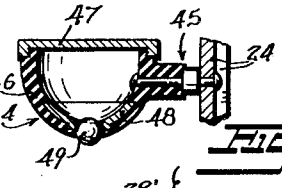


FIG. 7.

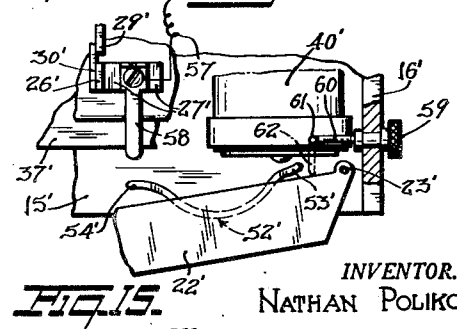


FIG. 10.

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ELECTRIC ALARM APPARATUS FOR BATHTUBS

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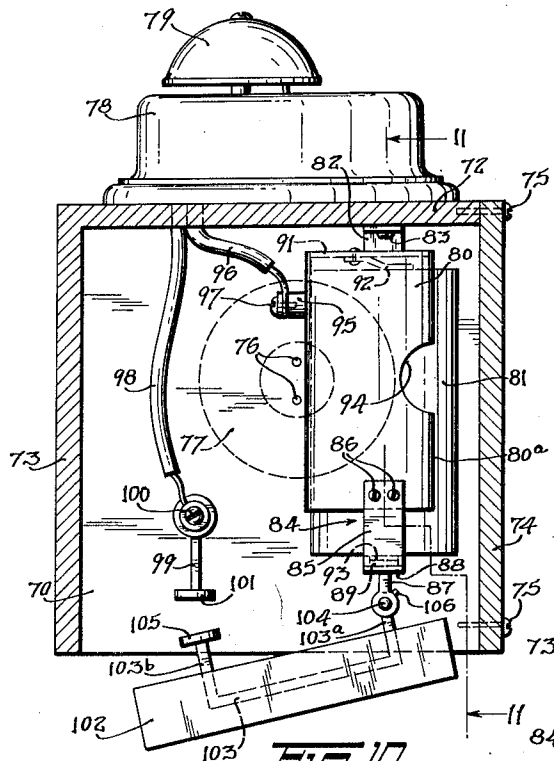


Fig. 10.

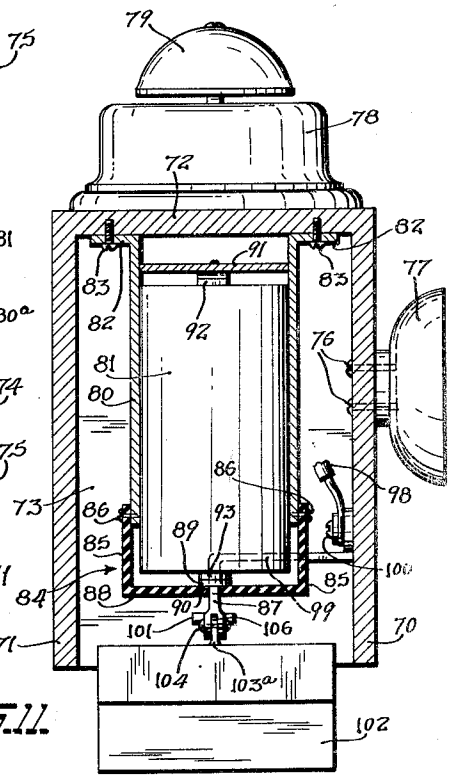


Fig. 11.

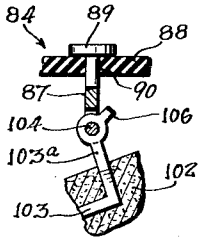


Fig. 12.

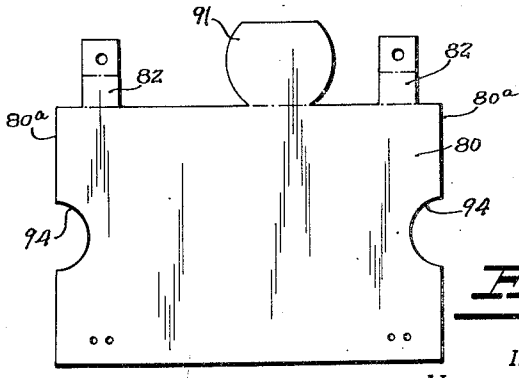


Fig. 13.

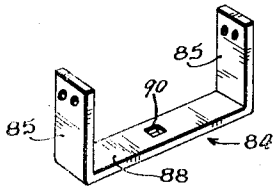


Fig. 14.

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UNITED STATES PATENT OFFICE

2,602,846

ELECTRIC ALARM APPARATUS FOR BATHTUBS

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Application April 12, 1949, Serial No. 86,941

4 Claims. (Cl. 177—311)

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This invention relates to new and useful improvements in electric alarm apparatus for use on a bathtub, and, more particularly, the aim is to provide a novel and valuable such apparatus, in the form of a small, compact, and preferably box-shaped device carrying a float actuator for sounding the alarm and having a housing adapted completely to contain the alarm bell, buzzer or the like and the source of energizing current and all parts of the alarm circuit; with said device of very light weight and so adapted to be conveniently stored when not in use in or on, for example, an ordinary bathroom medicine cabinet; and with said device permanently equipped with a simple one-piece instrumentality whereby the device may be instantaneously attached to or detached from a wall of a bathtub and yet in the former case to remain dependably attached by suction means.

In addition to the above another feature of the device is the inclusion therein of means so functioning that when the device, when not being used in temporary securement to a bathtub wall for emitting an alarm when the water inflowing into the tub has reached a predetermined level, but instead is in a storage place and lying there in any one of several casually likely dispositions, the alarm mechanism is maintained in such condition that the said mechanism is abnormally disabled regardless of an assumption by the float of a position which otherwise would cause the sounding of the alarm, thereby to insure that while the device is out of use there may not accidentally or carelessly occur either the annoyance of an unwanted signalling or any depletion of the curent source strength; said conditioning of the device being preferably effected automatically the moment the device is laid down anywhere and in any disposition other than that in which it is to be mounted on a bathtub wall for use as above, that is, in any disposition other than one in which the float depends from the bottom of the device.

Another object of the present invention proposes the provision of a small float release for holding the float in an inoperative position when the device is not in use in a manner to retain the circuit to the gong in an open position.

It is a further object of the present invention to construct an alarm apparatus for use on a bathtub which is simple and durable and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

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In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a front elevational view of the alarm apparatus of the present invention with the front cover removed and with portions thereof broken away.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is an elevational view of the main retained portion of a standard base plate of a familiar electric bell assembly with certain other parts of said assembly indicated in dot and dash lines.

Fig. 4 is a bottom elevational view of Fig. 3.

Fig. 5 is a perspective view of a bracket structure, per se.

Fig. 6 is a plan view of the tumbler mechanism looking in the direction of the line 6—6 of Fig. 1.

Fig. 7 is a vertical sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is a vertical sectional view taken on the line 8—8 of Fig.6.

Fig. 9 is a schematic wiring diagram of the alarm apparatus shown in Figs. 1 to 8.

Fig. 10 is a vertical sectional view taken through an alarm apparatus constructed in accordance with a modification of the present invention.

Fig. 11 is a vertical sectional view taken on the line 11—11 of Fig. 10.

Fig. 12 is a partial vertical sectional view taken through the pivot for the float of the form of the invention shown in Figs. 10 and 11.

Fig. 13 is a developed view of the blank used for forming the bracket used in the form of the invention shown in Figs. 10 and 11.

Fig. 14 is a perspective view of the member forming part of the bracket used in the form of the invention shown in Figs. 10 and 11.

Fig. 15 is a view similar to a portion of Fig. 1, but illustrating a further modified form of the present invention.

The alarm apparatus for use on a bathtub according to the form of the invention shown in Figs. 1 to 9, includes a housing having a back wall 15, a pair of side walls 16, a top wall 17, an open front and an open bottom. The open front is closed by a front wall 18 releasably secured to the side walls 16 by several screws 19.

A suction cup 20 is caried at the exterior side of the back wall 15 by means of a rivet 21.

The float is shown at 22, this desirably made of an insulative material; such as cork, but may be made of a light-weight readily moldable plastic; and said float is pivotally suspended from a rod or shaft 23.

The already mentioned standard base plate is designated 24, the same having suitable openings such as a main L-shaped upper opening 25, resulting in part from upstriking a high rib-tongue 25a, and a smaller rectangular opening 26, for providing a high tongue 26a. A familiar pad of insulation and a terminal thereon are indicated at 27. In the well-known manner the two coils 28 of an electromagnet are at their ends secured to the rib-tongue 25a. The other well-known parts shown are an armature bell-clapper arm 29, a leaf-spring hinge means 30 between the tongue 26a and the arm 29, a vibratory make and break device including the familiar leaf spring auxiliary 31 on the arm 29 and a coacting fixed contact 31a. Also carried by the base plate 24 are two tapped attachment apertures 32.

Said plate 24 as usually made has an upward extension 33 for mounting the bell. In the present case, however, the plate 24 is cut off along the dot and dash line marked 34 in Fig. 4, and said extension is discarded; and the bell, 35, is attached to an arm 36 integral with a main bracket 37. The bracket 37 has apertures 38 matching the apertures 32, whereby, when a pair of screws 39 are passed through the aligned apertures 32 and 38 and into the wall 15 of the housing, both the plate 24 and the bracket 37 are securely mounted on the wall 15.

A conventional dry cell 40 is also supported by the bracket 37, seated in a half cylindrical portion 41 of the bracket, but in a readily attachable, removable and replaceable manner by virtue of the provision of a ledge formation best seen in Fig. 5 and at the bottom of said portion 41 and the provision also of a pair of resilient half-hoops 42 and 43 riveted or otherwise secured at their butt ends to the bracket 37.

A tumbler 44 is fixedly secured to the back wall 15 of the housing by a rivet 45. The tumbler 44 includes a main body 46, made of insulative material, as one constituted by a readily moldable plastic; a screw cap 47; a liner shell 48 of conductive metal fitted into the bottom of the main body 46; and, rollably loose in the capped main body 46, a ball 49, which latter may be of steel, for maximum life, or of say brass, for better conductivity, or of say beryllium-copper alloy for both long wear and good conductivity. In forming the liner shell 48 it is provided with an offset finger 50, for attachment thereto, as by the solder indicated, of a wire lead 51. The lined bottom of the tumbler 44 has an opening shaped to prevent passage of the ball 49 therethrough yet to permit partial protrusion of the ball, as shown in Figs. 1, 2, 7 and 8.

Mounted in the float 22, there is a conducting strip 52 presenting two upstanding terminals 53 and 54. The function of this strip is made plain in Fig. 9, from its there observable relationship to the circuit employed and the associated parts; it being noted from this view that the wire lead 51 connects the liner shell 48 with one of the two series connected coils 28. The wire lead 55, as usual, goes to the tongue 26a and thence through the elements 30 and 31 to the contact-cone carried by the latter and normally touching the fixed contact 31a; and, also as usual, the wire lead 56 connects said fixed contact 31a and one terminal of the battery 40.

The operation of the alarm apparatus is as follows:

Normally, as per the arrow A shown near 23 in Fig. 9, the float 22 depends as shown in Figs. 1 and 2, so that the conducting strip 52 of the float is arranged as shown in Figs. 1, 2 and 9, with the terminal 53 spaced below the bottom terminal of the battery and the terminal 54 spaced below the ball 49 where said ball is in downward protrusion from the tumbler 44 when the apparatus is attached to the tub T with the walls 16 vertical. Now, the circuit for the alarm is broken at two points, that is, at 53 and 54.

As soon as the level of the inflowing water into the tub has reached that level in accordance with the desire for which the device has been attached to the tub wall, the float 22 rises and simultaneously brings the terminal 53 into contact with the center bottom terminal of the battery and the terminal 54 into contact with the ball 49. Said ball may be pushed upward slightly, but its own weight will keep it always in conductive relation to the liner 48. Thus, the bell will begin to ring and continue to ring; its energizing circuit being traceable as including the battery 40, the strip 52, the ball 49, the liner 48, the finger 50, the wire lead 51, the coils 28, the wire lead 55, the elements 26a, 30, 31 and 31a, and the wire lead 56 back to the battery.

When the alarm apparatus is removed from the wall of the tub T and rested in a horizontal or a vertical position on any of the walls of the housing, the ball will roll out of the opening in the bottom of the tumbler 44 to the then low position of the tumbler. In this new position, the ball 49 will be out of electrical contact with the shell liner 48, so that even if the float 22 should be in a pivoted position in which the contact 53 engages the bottom terminal of the battery 40 and the contact 54 engages the bottom of the tumbler 44 the circuit will not be closed to ring the alarm. This is due to the fact that the contact 54 will be engaging the non-conductive material of which the main body 46 of the tumbler 44 is made.

In the modification of the present invention shown in Figs. 10 to 14, the alarm apparatus comprises a housing having a back wall 70, a front wall 71, a top wall 72, a fixed end wall 73 and a removable end wall 74 held in position by several screws 75. The bottom of the housing is open. Secured to the back wall 70, by several screws 76, there is a suction cup 77 by which the apparatus can be removably mounted on the wall of a bathtub.

Mounted on the top wall 72, exteriorly of the housing, there is a casing 78 housing the usual solenoid operated mechanism for ringing a bell 79 secured in position on the casing 78.

Suspended from the top wall 72 of the housing on the interior thereof, there is a bracket 80 for supporting a conventional dry cell 81 preferably of the flashlight type. The bracket 80 is shaped from the blank illustrated in Fig. 13, which blank is bent into a U-shape in horizontal section and which has the free vertical edges 80a, on opposite sides of the open side thereof, flared outward for guiding the dry cell 81 into position in the bracket 80. Extended upward from the bracket 80 there is a pair of spaced apertured lugs 82 through which screws 83 are passed to be threaded into the top wall 72 for mounting the bracket 80 in position.

Secured in position across the open bottom of the bracket 80, there is a member 84 which is substantially U-shaped and formed of insulation material. The upstanding side arms 85 of the member 84 are secured to the sides of the bracket 80 by several bolts 86. A stem 87 is non-rotatively extended through the horizontal arm 88 of the member 84 and has, at its top end, an enlarged head 89 which rests on the top face of the horizontal arm 88 of the member 84. The stem 87 is preferably square in cross section and the opening 89 in the horizontal arm 84, through which the stem 87 passes, is similarly shaped.

The bracket 80 is formed with a plate portion 91 which is bent to overlie the adjacent end of the dry cell 81. Attached at one end to the plate portion 91, there is a small leaf spring 92, of conductive material, which has its other end bearing against the adjacent end of the dry cell 81. The bracket 80 is secured to the top wall 72 with its open side facing the removable end wall 74, so that when the end wall is removed, a dry cell 81 can be slipped into the bracket 80 with its end contact 93 making electrical contact with the enlarged head 89 of the stem 87 and with the leaf spring 92 making electrical contact with the exposed end of the shell contact of the dry cell 81. The leaf spring 92 urges the dry cell 81 downward in the bracket 80 insuring a good electrical contact between the end contact 93 and the enlarged head 89 and the leaf spring 92 and the shell contact. The free edges 80a of the bracket 80 are formed with recesses 94, see Figs. 10 and 13, permitting a finger grip to be had on the dry cell 81 permitting it to be pulled from the bracket 80 when desired.

A boss 95 is formed on the bracket 80 and one end of an electrical lead 96 is connected to the boss 95 by means of a screw 97. The other end of the lead 96 is connected to one side of the solenoid of the solenoid operated mechanism contained in the casing 78. A lead 98 is connected at one end to the other side of the solenoid and has its other end projected into the housing and connected to a stiff conductor strip 99 by a screw 100. The screw 100 also secures one end of the conductor strip 99 fixedly to the back wall 70 of the housing. The free end of the conductor strip 99 is formed with an enlarged contact 101.

A float 102, formed of cork or other water floatable material, has embedded therein a conductor strip 103 of metal. The bottom end of the stem 87 is bifurcated and one end 103a of the conductor strip 103 is projected from the float 102 and received between the spaced portions of the stem 87. A rivet 104 is extended through the overlapped portions of the stem 87 and the projected end 103a of the conductor strip 103 pivotally supporting the float 102 on the stem 87 and completing the electrical circuit from the stem 87 to the conductor strip 103.

The other end 103b of the conductor 103 is also projected from the float 102 and is provided at its free end with an enlarged contact 105 which is to make electrical contact with the enlarged contact 101 of the conductor strip 99 to complete the electrical circuit and ring the alarm when the float 102 is pivoted about the rivet 104 by the action of the water rising in the bathtub.

Extending radially from one side of the end 103a of the conductor strip 103, there is a lug 106, which is arranged to abut the end of the

stem 87, as shown in Fig. 12, and limit downward pivoting of the float 102 to the position shown in Fig. 11.

It is believed that the operation of this modified form of the invention will be apparent and that a further description of the operation is unnecessary.

Referring to the modification of Fig. 15, wherein the parts to which are applied reference numerals with primes added correspond, respectively, to the parts to which have been applied the same reference numerals but without primes in the form of the invention shown in Figs. 1 to 9, there is substituted, for the tumbler 44, a downwardly elongated portion 58 of the terminal 27' and of such size and shape that the lower end of this element 58 will be touched by the contact 54' of the strip 52' simultaneously with a touching by the contact 53' of the bottom center terminal of the battery 40'. Therefore, since the wire lead 57 is connected to the coils 28 as is the wire lead 51 in Fig. 9, the moment the float rises to dispose the strip 52' as just above stated, the device operates as described in connection with Figs. 1–9. The means here shown for being manually actuated to prevent inadvertent making of the alarm circuit by unintended swing of the float 22', comprises a turn-button 59 fixed beyond the wall 16' to a shaft rotatably extended through said wall and beyond the latter fixedly carrying a rod 60 having a perpendicularly offset arm 61, which arm 61 may be redisposed as shown by the dot and dash lines 62 for wedgingly holding the float against swing on its shaft 23' toward the battery.

In other respects this form of the invention is similar to the first form and while the manually controllable mechanism for holding the float in an inoperative position is shown applied to an alarm apparatus similar to that shown in Figs. 1 to 9, this is by way of illustration only, as such manually controllable mechanism is well adapted to use on the form of the invention shown in Figs. 10 to 14 and its application to that form of the invention will be obvious to those skilled in the art to which the present invention pertains.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A water-level bathtub alarm device, comprising a casing to be mounted at a desired height on the wall of a bathtub, an alarm-sound emitter therein and including an actuator operating in response to electrical energization, a float pivotally suspended from a lower point on said casing, a circuit having interposed therein said actuator, a switch means associated with said circuit for normally breaking the same, said switch means being operable to close said circuit when the float predeterminedly swings upward, and a means for disabling said switch means regardless of a swing of the float, when the device is disposed, as when not in use, in a position such that the float is not in its prevised suspension from the device, said disabling means including a plurality of elements one of which is moved by its own weight relative to another and in such manner that thereby said disabling is automatically

effected when the device is disposed so that the float is not suspended as last stated.

2. A water-level bathtub alarm device, comprising a casing to be mounted at a desired height on the wall of a bathtub, an alarm-sound emitter therein and including an actuator operating in response to electrical energization, a float pivotally suspended from a lower point on said casing, a circuit having interposed therein said actuator, a switch means associated with said circuit for normally breaking the same, said switch means being operable to close said circuit when the float predeterminedly swings upward, and a means for disabling said switch means regardless of a swing of the float, when the device is disposed, as when not in use, in a position such that the float is not in its prevised suspension from the device, said disabling means including a plurality of elements one of which is moved by its own weight relative to another and in such manner that thereby said disabling is automatically effected when the device is disposed so that the float is not suspended as last stated, said element moved by its own weight being a ball of conductive material, and another part of said disabling means being a rotatively mounted container for said ball having an interior so large and so shaped as to permit free rolling of the ball inside the container in a multiplicity of different directions.

3. A water-level bathtub alarm device, comprising a casing to be mounted at a desired height on the wall of a bathtub, an alarm-sound emitter therein and including an actuator operating in response to electrical energization, a float pivotally suspended from a lower point on said casing, a circuit having interposed therein said actuator, a switch means associated with said circuit for normally breaking the same, said switch means being operable to close said circuit when the float predeterminedly swings upward, and a means for disabling said switch means regardless of a swing of the float, when the device is disposed, as when not in use, in a position such that the float is not in its prevised suspension from the device, said disabling means including a plurality of elements one of which is moved by its own weight relative to another and in such manner that thereby said disabling is automatically effected when the device is disposed so that the float is not suspended as last stated, said element moved by its own weight being a ball of conductive material, and another part of said disabling means being a rotatively mounted container for said ball having an interior so large and so shaped as to permit free rolling of the ball inside the container in a multiplicity of different directions, said container having an opening through which said ball may protrude but through which said ball cannot pass, and said container being inclusive of conductive material all around and adjacent to said opening.

4. A water-level bathtub alarm device, comprising a casing to be mounted at a desired height on the wall of a bathtub, an alarm-sound emitter therein and including an actuator operating in response to electrical energization, a float pivotally suspended from a lower point on said casing, a circuit having interposed therein said actuator, a switch means associated with said circuit for normally breaking the same, said switch means being operable to close said circuit when the float predeterminedly swings upward, and a means for disabling said switch means regardless of a swing of the float, when the device is disposed, as when not in use, in a position such that the float is not in its prevised suspension from the device, said disabling means including a plurality of elements one of which is moved by its own weight relative to another and in such manner that thereby said disabling is automatically effected when the device is disposed so that the float is not suspended as last stated, said element moved by its own weight being a ball of conductive material, and another part of said disabling means being a rotatively mounted container for said ball having an interior so large and so shaped as to permit free rolling of the ball inside the container in a multiplicity of different directions, said container having an opening through which said ball may protrude but through which said ball cannot pass, and said container being inclusive of conductive material all around and adjacent to said opening, said container having a rotund bottom interior all around and adjacent to said opening.

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