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Sherrick et al.

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[54] **SAFETY ALARM ASSEMBLY FOR SWIMMING POOLS AND THE LIKE**

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[52] **U.S. Cl.** .....**116/67,** 9/8, 116/111, 116/118, 340/244 A, 340/263

[51] **Int. Cl.**.....**G08b 3/02**

[58] **Field of Search**.....116/109, 110, 111, 118, 67, 116/106, 107, 108; 73/319, 322; 9/8; 340/261, 366, 244 A, 244 B, 244 C

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[57] **ABSTRACT**

An alarm has a trigger mechanism actuatable by the influence of gravity. A tiltable support which is preferably a pivotally mounted shaft-like member with a seat at its upper end is operable when in its at rest position to support the trigger mechanism to counteract the influence of gravity. A float is connected to tilt the support away from its at rest position as a function of pool disturbance so that the trigger mechanism slips from the support seat and actuates the alarm to indicate pool disturbance.

10 Claims, 5 Drawing Figures

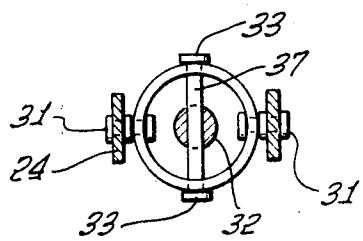


FIG. 1.

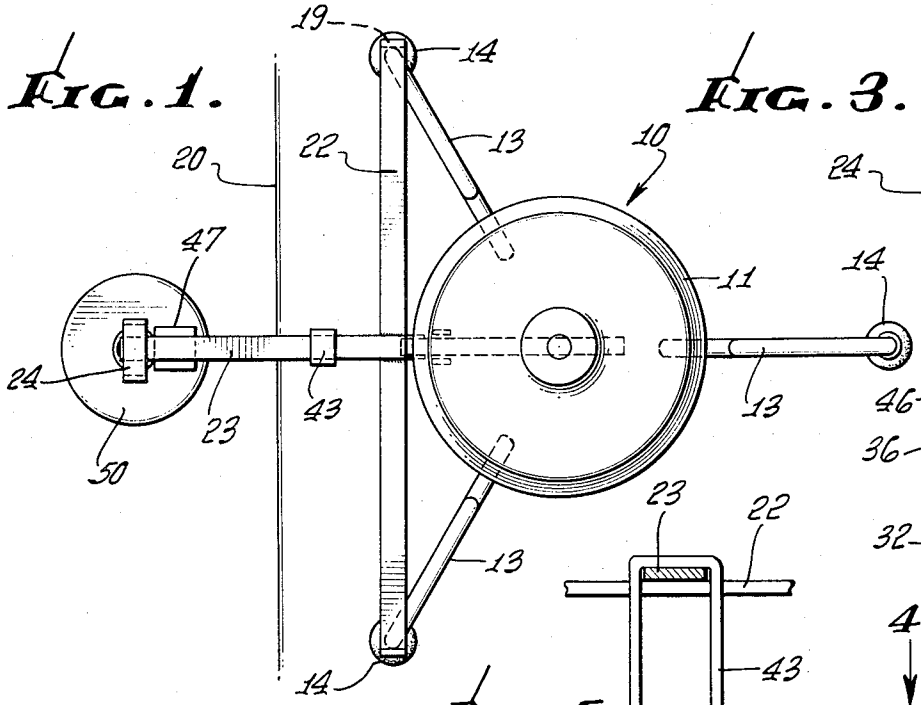


FIG. 3.

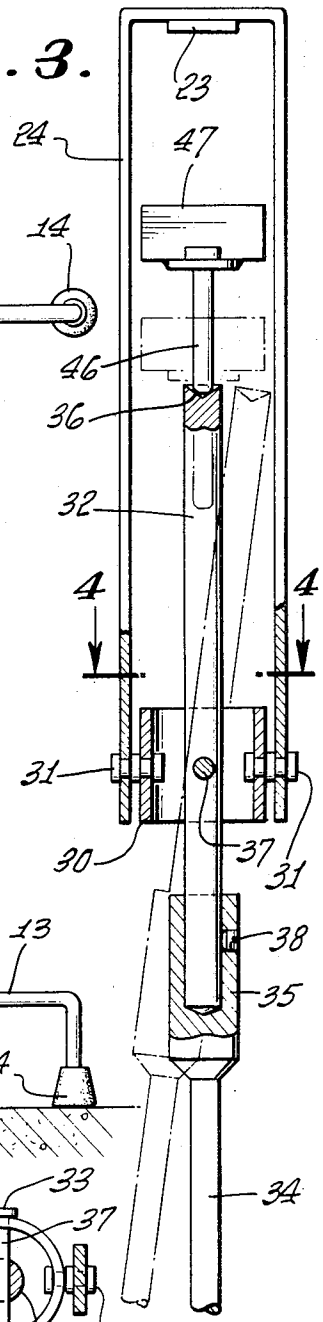


FIG. 5.

FIG. 2.

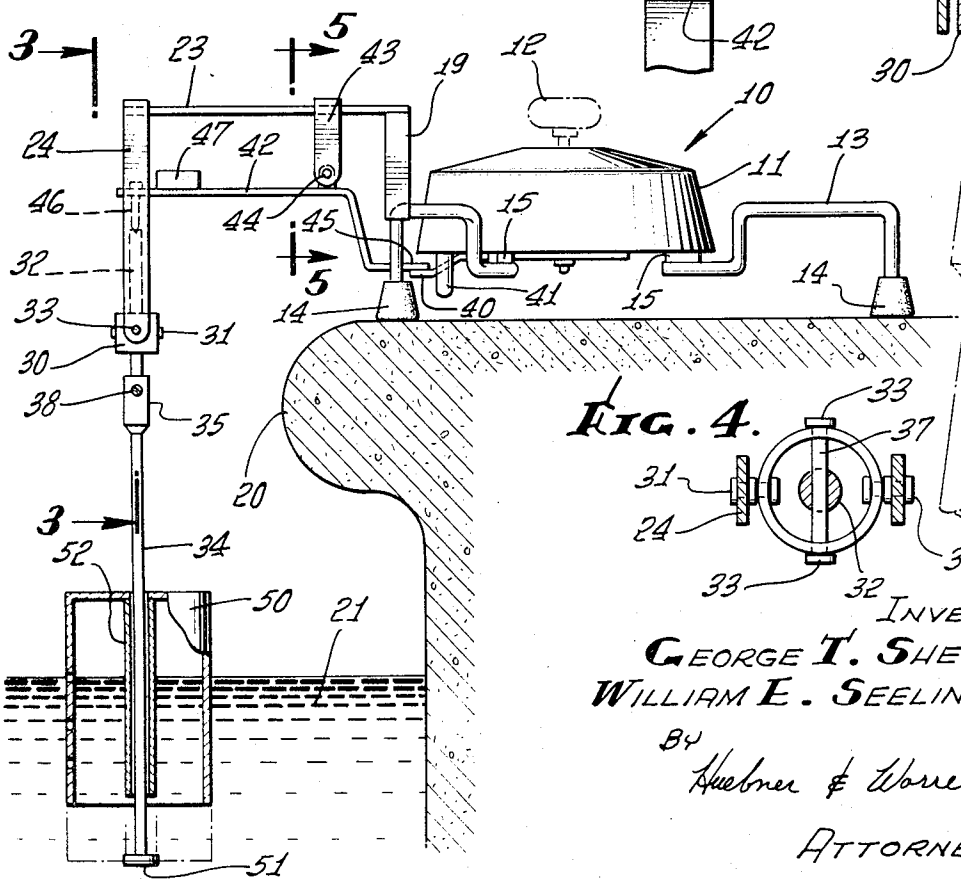


FIG. 4.

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SAFETY ALARM ASSEMBLY FOR SWIMMING POOLS AND THE LIKE

BACKGROUND OF THE INVENTION

The present invention relates to alarms, and more particularly to an improved safety alarm assembly for swimming pools and the like.

In present-day life, the home swimming pool unwatched by a lifeguard is becoming more and more commonplace. Such unwatched swimming pools constitute a hazard for small children and animals. One manner in which pool owners have tried to prevent children and animals from falling into their pools is by fencing the pools in. Fencing, however, is costly and not foolproof since children and animals seem to have a knack for getting into fenced enclosures. Consequently, various types of pool safety alarms have been devised for alerting pool owners that someone or something is causing a disturbance in their pool. These prior art pool alarms have ranged from very simple to highly sophisticated devices and have been of varying degrees of effectiveness.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an improved safety alarm assembly for a swimming pool or the like which is characterized by being of simple and inexpensive construction, yet extremely efficient operation.

It is further an object of the present invention to provide an improved safety alarm assembly for swimming pools and the like which is operable to detect pool disturbance of the type created by the presence of a person or animal in the pool.

It is also an object of the present invention to provide an improved pool safety alarm assembly having an alarm with a trigger mechanism actuatable by gravity and a tiltable support operable to support the trigger mechanism to counteract the influence of gravity which is tilted out from under the trigger mechanism by pool disturbance to actuate the alarm.

In accomplishing these and other objects, there is provided in accordance with the present invention a safety alarm assembly for a pool having an alarm which is triggered by a trigger mechanism actuatable by the influence of gravity. A tiltable support which is preferably a pivotally mounted shaft-like member with a seat on its upper end is operable whenever the support is in its at rest position to support the trigger mechanism to counteract the influence of gravity. A float for floating in a pool being monitored is connected to the support and is operable to tilt the support and its seat away from the at rest position as a function of pool disturbance so that the trigger mechanism unseats and actuates due to the influence of gravity to indicate pool disturbance whenever pool disturbance moves the float sufficiently to tilt the support and seat a predetermined extent away from its at rest position. The safety alarm assembly is suitable for mounting on the edge of a swimming pool or the like or may be carried by a portable housing which floats within a pool.

Additional objects of the present invention reside in the specific construction of the exemplary pool safety alarm assembly hereinafter particularly described in the specification and shown in the several drawings:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a top plan view of a pool safety alarm assembly according to the present invention positioned at the edge of a swimming pool;

FIG. 2 is a side elevation view of the safety alarm assembly and swimming pool of FIG. 1 showing the float portion of the alarm assembly in section to disclose its inner construction;

FIG. 3 is a view taken along the line 3—3 of FIG. 2;

FIG. 4 is a view taken along the line 4—4 of FIG. 3; and

FIG. 5 is a view taken along the line 5—5 of FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings in more detail, there is shown in FIGS. 1 and 2 a pool safety alarm assembly generally designated by the numeral 10. The assembly 10 has a conventional selectively actuatable alarm means 11 which preferably drives a bell. The alarm 11 shown is of the mechanical spring wound type, but is noted that other types of alarms, such as electrically powered alarms, could be used and that lights or other alerting means could be driven by the alarm instead of a bell. The mechanical bell alarm 11 is wound by a key 12 and the alarm 11 is mounted on a tripod arrangement formed by feet members 13. The feet 13 preferably have rubber shoes 14 fitted on their lower ends and are joined with the body of the alarm 11 by means of spacers 15.

The pool alarm assembly 10 is shown in FIGS. 1 and 2 positioned at the edge of a swimming pool 20 with a portion of the alarm assembly 10 extending over and downward into water 21 in the pool 20. The alarm assembly 10 in addition to having the frame structure provided by the feet members 13 has rigid uprights 19 which extend from the two feet members 13 nearest to the pool edge. The uprights 19 are interconnected at their upper ends by a rigid bar 22. Secured preferably centrally to the bar 22 is a rigid frame member 23 which extends from the bar 22 to a point over the water 21. Mounted on the end of the bar 23 over the water 21 is a rigid member 24 having a relatively short top portion and two relatively long downwardly extending spaced apart side portions. The rigid frame member 24 is shown in more detail in FIG. 3 and has a gimbal or gimbal means 30 pivotally mounted on shaft-like extensions 31 between the lower ends of its side portions. Pivotally mounted in the gimbal 30 is a rod 32 by means of a shaft 37 which pivots at points 33 as is shown in FIG. 4. By this gimbaled mounting arrangement the rod 32 is tiltably mounted for movement in all directions. It is noted that the rod 32 is preferably pivotally mounted at a point somewhere along its length other than at its ends.

The rod 32 has coupled or secured to its lower end a downwardly extending shaft 34 by means of a clamp or coupling arrangement 35 which includes a clamping screw 38. The coupled rod 32 and shaft 34 form a shaft-like support member which has a substantially vertical at rest position and is pivotally mounted at the lower end of the frame member 24 for tiltable movement in all directions. This shaft-like, tiltable support member is for supporting the trigger mechanism of the

selectively actuatable alarm **11** and has a preferably concave seat **36** formed in its upper end, i.e., in the upper end of the rod **32**. The seat **36** is concavely shaped to be suitable for receiving and supporting a pointed downward extending arm.

The trigger mechanism of the alarm **11** includes an alarm trigger **40**, shown in FIG. **2**, which is spring biased upward by means not shown to an alarm actuating position. Vertical guides **41** are mounted on each side of the alarm trigger **40** to limit the movement of the trigger **40** to up and down movement in the vertical plane. The alarm trigger mechanism also includes an actuator arm **42** which is pivotally mounted on a rigid downward extending support member **43**. The support member **43** is similarly shaped, but smaller than, the earlier described rigid frame member **24**.

The pivotal mounting of the actuator arm **42** is shown in more detail in FIG. **5**. The downward extending rigid member **43** is secured along the horizontally extending frame member **23** at a selected point between its ends and the actuator arm **42** is pivotally mounted on a shaft **44** extending between the lower ends of the rigid member **43**. The actuator arm **42** is shaped to extend downward from its pivot to a point adjacent the alarm trigger **40** and has a flat pressure applying portion **45** there formed for applying pressure to and holding the alarm trigger **40** downward away from its alarm actuating position. A downward extending pointed or needle-like portion **46** is formed or mounted on the other end of the actuator arm **42** to mate with the seat **36** formed in the upper end of the rod **32**. A weight or weight means **47** is mounted on the actuator arm **42** on the side of its pivot carrying the downward extending arm portion **46**. The weight **47** functions to unbalance the actuator arm **42** making the portion of the arm carrying the pointed portion **46** relatively heavier. Thereby, the end of the actuator arm **42** extending over the water **21** falls downward due to the influence of gravity whenever its pointed portion **46** is not being supported by the pivotally mounted rod **32** so that the alarm trigger **40** is no longer held away from its alarm actuating position by the pressure applying actuator arm portion **45**. In this manner, the alarm trigger **40** is freed so that it will move upwards to its alarm actuating position and actuate the alarm **11** whenever pool disturbance unseats the pointed arm portion **46** of the actuator arm **42** from the seat **36**.

The pool safety alarm assembly **10** also includes a float **50** which preferably is in the form of a tin can slidably mounted by an inner sleeve **52** on the lower end of the shaft **34** for up and down movement therealong. The float **50** floats in the pool water **21** and a mechanical stop **51** is mounted on the lower end of the shaft **34** to prevent the float **50** from sliding off the lower end of the shaft **34**. It is noted that holes may be formed in the can type float **50** in order to set and establish the depth at which the float **50** floats in the water **21**. The float **50**, in cooperation with the stop **51**, additionally functions to weight the lower end of the shaft **34** so that the shaft-like tiltable support formed by the shaft **34** and the rod **32** normally assumes due to the influence of gravity an at rest position in which the longitudinal axes of the rod **32** and the shaft **34** extend vertically. It is noted that the rod **32** and shaft **34** are preferably coupled together with their longitudinal axes substantially aligned.

In operation and use of the pool safety alarm assembly **10**, the assembly **10** is positioned adjacent the edge of a swimming pool, as shown in FIGS. **1** and **2**, with the feet members **13** supporting the assembly **10** at the pool edge. The wind-up key **12** is next turned to fully wind the spring of the alarm **11** so that the alarm **11** is ready for actuation. During the winding of the alarm **11**, the alarm trigger **40** is depressed and held away from its alarm actuating position. The tiltable support provided by the rod **32** and the shaft **34** are positioned in the pool water **21** with the float **50** floating therein and the tiltable support is permitted to assume its at rest position in the true vertical. The pointed end portion **46** of the actuator arm **42** is then seated in the seat **36** formed on the upper end of the rod **32** so that the actuator arm **42** is supported in the position shown in FIG. **2** whereat it is operative to apply pressure through its pressure applying portion **45** to hold the trigger alarm **40** away from its alarm actuating position. The pool safety alarm **10** is now set to monitor disturbance of the water **21** in the pool **20**, with the tiltable support provided by the rod **32** acting to counteract the influence of gravity on the alarm's trigger mechanism.

Should an animal or child now fall in the pool **20**, waves are created which laterally move the float **50** so as to pivot and tilt the shaft-like support member formed by the rod **32** and the shaft **34**. As a result, the shaft-like support member is pivoted to the predetermined extent necessary away from its at rest position to move the seat **36** out from under the pointed arm portion **46** of the actuator arm **42** as shown in dashed lines in FIG. **3**. Thereby, the actuator arm **42** is unseated and the trigger mechanism provided by the actuator arm **42** and the alarm trigger **40** are actuated due to the influence of gravity to trigger the alarm **11** and indicate pool disturbance. The trigger mechanism functions to trigger the alarm **11** due to the influence of gravity by its weighted pointed arm portion **46** falling or slipping from the seat **36** so that the other end of the actuator arm **42** which carries the pressure applying portion **45** is moved upward to free the alarm trigger **40**. The alarm trigger **40** which is biased upward toward its alarm actuating position then automatically moves upward and actuates the alarm **11**, thereby to alert the owners of the pool being monitored that a disturbance has been created in the water **21** of the pool **20**.

It is noted that various modifications may be made in the construction of pool safety alarm in accordance with the present invention. For example, a wing-type float could be used instead of the can **50** as the means for sensing pool disturbance and tilting the tiltable support means as a function thereof. Also, it is noted that instead of mounting the alarm assembly **10** adjacent the edge of a pool that the entire assembly could be mounted to float in a floatable housing, such as a styrofoam float. Additionally, it is noted that by changing the location of the pivot point of the shaft-like support member, the sensitivity of the pool safety alarm assembly **10** may be adjusted. For example, increasing the length of the tiltable shaft-like support above its pivotal mounting point causes the seat **36** to be moved a greater distance by a given amount of angular movement of the lower end of the shaft **34** and increases alarm sensitivity. Conversely, by shortening the length of the shaft-like tiltable support above its pivot point,

the seat 36 is caused to move a lesser distance for a given amount of angular movement of the lower end of the shaft 34 and the alarm sensitivity is thus decreased.

Thus, there has been provided an improved safety alarm assembly for a swimming pool or the like which is characterized by being of relatively simple and inexpensive construction yet efficient operation. The alarm assembly provided has trigger mechanism which is actuated by the influence of gravity and includes a tiltable support sensitivity to pool disturbance which is operable to support and thereby counteract the influence of gravity on the trigger mechanism when in its at rest position. Further, the sensitivity of the alarm assembly to pool disturbance may be adjusted by changing the location of the pivot point of the tiltable support member.

Although we have herein shown and described our invention in what we have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of our invention.

We claim:

1. A safety alarm assembly for a pool comprising:
- a selectively actuatable alarm means including a trigger mechanism, said trigger mechanism being actuatable by the influence of gravity to trigger said alarm means;
- tiltable support means positioned for supporting said trigger mechanism to counteract the influence of gravity, said support means having an at rest position in which it is operable to support said trigger mechanism; and
- means for sensing pool disturbance and tilting said support means away from its at rest position in response to pool disturbance whereby said trigger mechanism slips from said support means whenever said support means is tilted to a predetermined extent away from its at rest position.

2. The invention recited in claim 1, wherein said means for sensing pool disturbance and tilting said support means is a float connected to said support means.

3. The invention recited in claim 1, wherein:
- said trigger mechanism includes an arm having a downward extending pointed portion; and
- said support means includes an upward opening concave seat which is positioned below said pointed arm portion and adapted to receive and support said pointed arm portion when in its at rest position.

4. The invention recited in claim 3, wherein:
- said support means is mounted to be tiltable in all directions away from its at rest position; and
- said means for sensing pool disturbance and tilting said support means in a float connected to said support means so as to unseat said pointed arm portion from said seat whenever said float tilts said support means and seat to said predetermined extent away from the at rest position.

5. The invention recited in claim 1, wherein:
- said trigger mechanism includes an arm having a downward extending pointed portion;
- said support means includes a shaft-like member mounted below said pointed arm portion to be tiltable in all directions, said shaft-like member being weighted to have a substantially vertical at rest position and having a seat formed on its upper end which is adapted to receive and support said pointed arm portion when said shaft-like member is in its at rest position; and
- said means for sensing pool disturbance and tilting said support means is a float slideably mounted on the lower end of said shaft-like member for longitudinal movement therealong which is operable to laterally move and tilt said shaft-like member in response to pool disturbance and unseat said pointed arm portion by moving said seat out from thereunder whenever said shaft-like member is tiled to a predetermined extent.

6. The invention recited in claim 1, wherein:
- said trigger mechanism includes an alarm trigger which controls the actuation of said alarm means, said alarm trigger being biased towards its alarm actuating position;
- said trigger mechanism also includes a pivotally mounted arm having a downward extending pointed portion, said arm being operable when supported by said support means to hold said alarm trigger away from its alarm actuating position;
- said support means includes a shaft-like member mounted below said pointed arm portion to be tiltable in all directions, said shaft-like member being weighted to have a substantially vertical at rest position and having a seat formed on its upper end which is adapted to receive and support said pointed arm portion when said shaft-like member is in its at rest position; and
- said means for sensing pool disturbance and tilting said support means is a float slideably mounted on the lower end of said shaft-like member for longitudinal movement therealong which is operable to laterally move and tilt said shaft-like member in response to pool disturbance and unseat said pointed arm portion by moving said seat out from thereunder whenever said shaft-like member is tilted to a predetermined extent whereupon said alarm trigger is freed and automatically moves to its alarm actuating position to actuate said alarm means.

7. The invention recited in claim 6, wherein said shaft-like member is pivotally mounted by gimbal means at a selected point between its upper and lower ends.

8. A safety alarm assembly for a pool, comprising:
- a frame structure;
- an alarm mounted on said frame structure, said alarm including a trigger which controls its actuation, said trigger being biased towards its alarm actuating position;
- an actuator arm pivotally mounted on said frame structure for up and down movement, said arm having a pressure applying portion formed on one side of its pivot to apply pressure to said trigger to hold it away from its alarm actuating position and a downward extending portion formed on the other side of its pivot;
- a shaft-like member tiltably mounted on said frame structure below said downward extending arm portion, said shaft-like member having a substantially vertical at rest position and having a seat formed

on its upper end which is operable to support said downward extending arm portion when said shaft-like member is in its at rest position so that said pressure applying arm portion applies pressure to said trigger to hold said trigger away from its alarm actuating position; and

a float connected to said shaft-like member to float in a pool being monitored and tilt said shaft-like member away from its at rest position in response to pool disturbance whereby said downward extending arm portion slips from said seat to free said trigger, and hence said alarm is actuated whenever pool disturbance moves said float sufficiently to tilt said shaft-like member the extent necessary to move said seat out from under said downward extending arm portion.

9. The invention recited in claim **8**, wherein:

said seat is concave in shape and opens upward; and

said downward extending arm portion is pointed in shape to mate with said concave seat.

10. The invention recited in claim **8**, wherein said shaft-like member is pivotally mounted at a selected point between its upper and lower ends to be tiltable in all directions.

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