United States Patent

Ellison

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[54] **DRIFTING ANCHOR ALARM**

[72] Inventor: **Edward F. Ellison,** 1212 Sandcastle Dr., Corona del Mar, Calif. 92625

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[52] **U.S. Cl.** ..... **114/206 R,** 340/29

[51] **Int. Cl.** **B63b 21/24**

[58] **Field of Search** ..... 114/206 R, 209; 340/29; 242/57; 254/174

[56] **References Cited**

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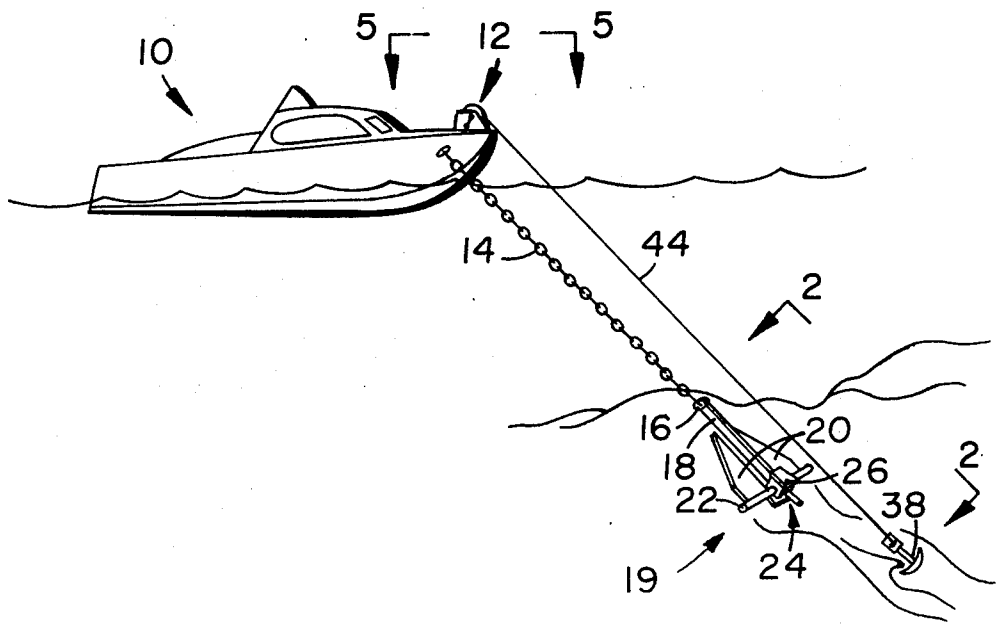
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Primary Examiner—Milton Buchler
Assistant Examiner—F. K. Yee
Attorney—George F. Bethel

[57] **ABSTRACT**

A Drifting Anchor Alarm for detecting when a boat anchor is moving with respect to the general position in which it has been dropped and secured comprising spring biased locking detents and an overlying collar for connecting and maintaining an auxiliary anchor to a main anchor in a separable relationship during and after they are dropped. The locking detents are unlocked by a line connected to the collar so that release of the auxiliary anchor can be effectuated by pulling the line. After the auxiliary anchor is unlocked from the main anchor subsequent main anchor drift will pay out the line which is attached to an indicator to show that the main anchor is drifting.

10 Claims, 7 Drawing Figures



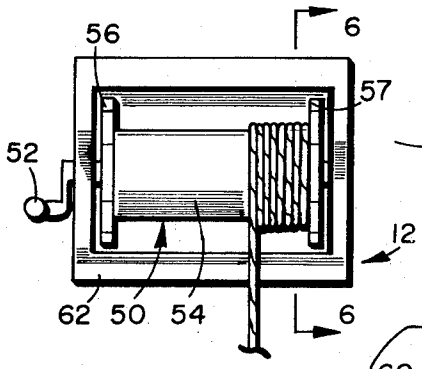


FIG. 5

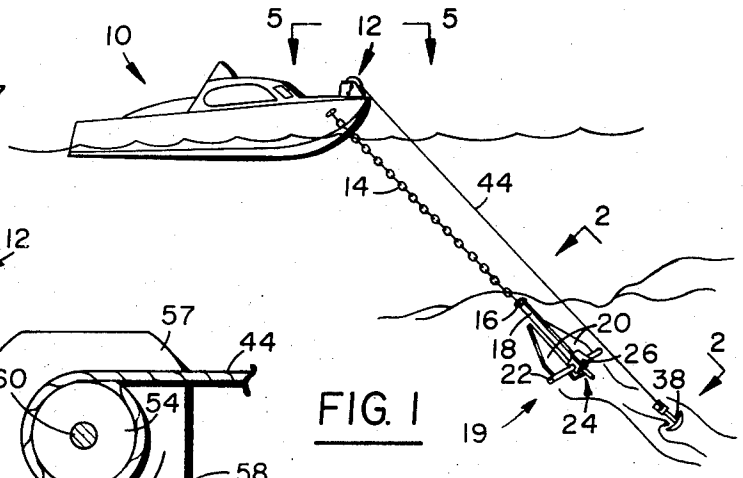


FIG. 1

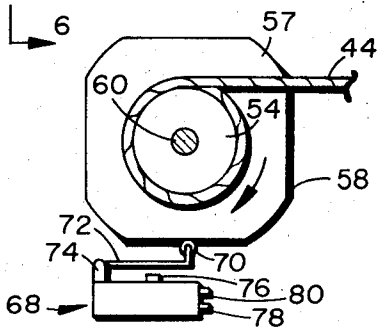


FIG. 6

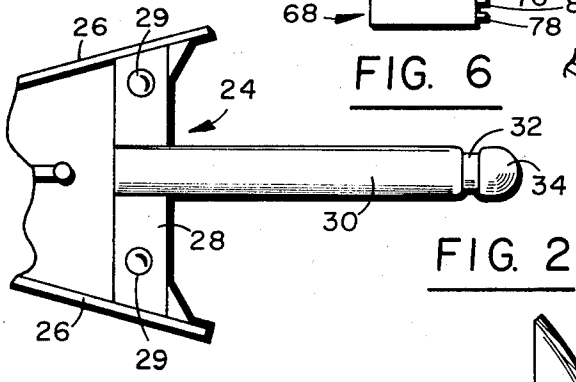
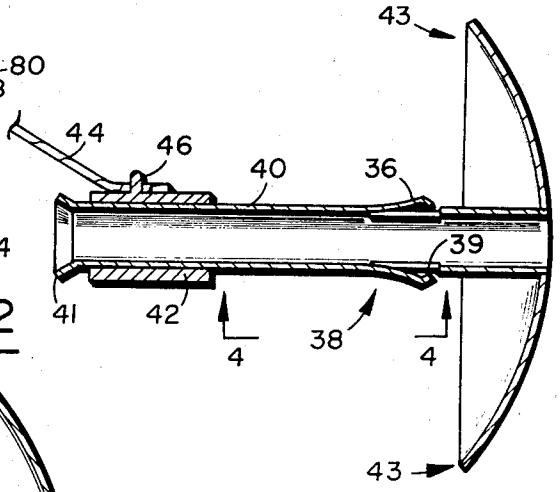


FIG. 2



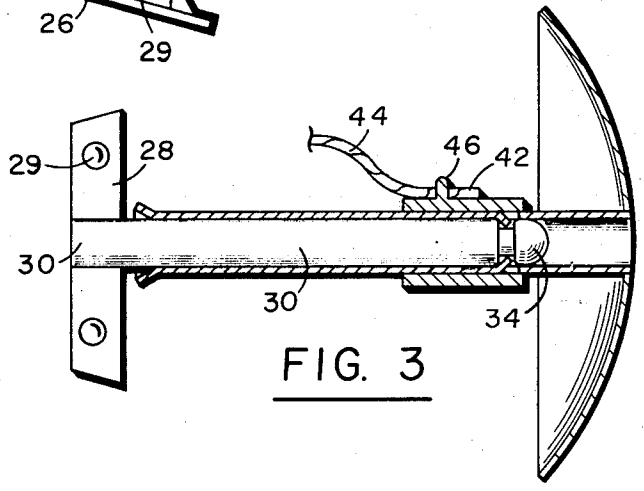


FIG. 3

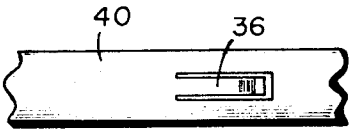


FIG. 4

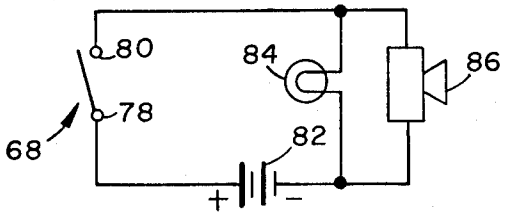


FIG. 7

INVENTOR.
EDWARD F. ELLISON
BY
GEORGE F. BETHEL
ATTORNEY

DRIFTING ANCHOR ALARM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The field of this invention is within the art of boat anchors and more specifically, alarms and means for detecting when anchors are dragging or drifting.

2. Review of the Prior Art With Respect to Applicant's Invention

The prior art relating to anchor drift alarms and warning systems has comprised a plurality of lines leading from the deck of a boat. One of the lines is often used to anchor the boat. A second line functions to provide a warning of when the anchor is drifting or moving.

Some prior art systems employ a rotating drum having means to determine when the anchor is drifting by turning of the drum. Other systems utilize a second line having a fixed depth indicator so that when the anchor is dragging and the boat moves into a shallow area, slack on the second line will cause a device to issue a warning.

At least one prior art anchor system employs a buoy and mushroom anchor with a second anchor providing an anchoring force. The mushroom anchor when pulled by shifting of the boat, causes a warning device to issue a signal. Another drift alarm system incorporates a complicated trigger actuated in response to movement of the boat with respect to a second anchor. Other forms of drift alarm devices incorporate a warning signal which is actuated when the boat moves in a fore and aft manner by movement of a member connected to a plummet line.

In all of the foregoing devices, the apparatus is quite complicated. Furthermore, in some cases when the boat moves in a lateral manner, the warning device is not actuated. Other drawbacks of the foregoing devices are such that they will not indicate when a boat is drifting seaward, and the location of the auxiliary anchor is difficult to maintain.

In all of the foregoing devices a major deficiency lies with the fact that an auxiliary anchor is cast out on a separate line away from the main anchor. Consequently, when the boat moves around its anchorage the lines of the main and auxiliary anchors become snagged or tangled. When the lines become snagged or tangled the warning device can be actuated or made inoperative. The prior art devices do not appear to have been manufactured, although they have been disclosed in certain patents.

In order to overcome the foregoing deficiencies, including tangling, this invention incorporates the placement of a mushroom or bell-shaped disc anchor as an auxiliary anchor in direct juxtaposition to the main anchor. After the anchors have been placed in direct juxtaposition to each other, the boat is free to rotate about its main anchor without snarling the lines.

Specifically, after the main anchor has been set, the auxiliary anchor is released from its fixed relationship with the main anchor but remains in close relationship to the main anchor to avoid line entanglement. As the main anchor drags or drifts, the auxiliary anchor maintains its position as originally fixed by the main anchor. After the auxiliary anchor is released, dragging of the main anchor by the boat will provide relative movement of the boat away from the auxiliary anchor so that the line to which the auxiliary anchor is attached will be paid out. The paying out of the line is used to actuate a warning device so that notice can be given of a dragging anchor.

It should be specifically noted that in sharp contradistinction to the prior art, when the boat rotates about its anchorage, without substantial anchor drag, the auxiliary anchor of this invention remains with the main anchor and the lines are not fouled, snagged or tangled.

SUMMARY OF THE INVENTION

In summary, this invention provides a main anchor with an auxiliary anchor having a separable relationship to the main anchor. The auxiliary anchor can be released from the main anchor by a line which causes a releasing collar to free the anchors from connected relationship. A line is attached to the auxiliary anchor and affixed to a warning device on the boat so that when the line is paid out, the warning device will issue a signal to indicate drifting of the main anchor.

The invention specifically allows movement of the boat in a three hundred and sixty degree arc around its anchor without fouling of the main anchor line or chain with the line attached to the auxiliary anchor. Thus a boat can shift without any problem of frustrating or eliminating the capability of the auxiliary anchor to pay out the line attached thereto when the main anchor drifts. Additionally, the main anchor may be weighed without fouling the auxiliary anchor line.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows an elevation and perspective view of a boat utilizing this invention.

FIG. **2** shows the main anchor and the auxiliary anchor in separated relationship as seen along line **2—2** of FIG. **1**;

FIG. **3** shows a partial cross-section of the auxiliary anchor affixed to a spindle which is attached to the main anchor;

FIG. **4** shows a fragmented side view of the auxiliary anchor spring locking detents;

FIG. **5** shows a windlass with an appropriate warning action which also serves to pay out and receive the auxiliary anchor line;

FIG. **6** is a side view of the windlass of FIG. **5** along line **6—6** thereof; and

FIG. **7** is a circuit in which the windlass switch is placed for actuation of a warning device. **7**

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Looking at FIG. **1**, a boat **10** is shown having a winch or windlass **12** rigged to the bow thereof. Extending from the boat is an anchor chain **14** which may be extended from a hawse hole or from the deck of the boat **10**. The anchor chain **14** is affixed to a ring **16** on a main Danforth type anchor **19** having a shank **18** with a respective pair of flukes **20**. The flukes **20** are attached to an arm **22** in a normal manner for movement with the arm outside of the plane of the shank **18**. At a crown **24** a pair of angular plates **26** are provided so that the arm **22** which is pivotally mounted for restricted movement will cause the flukes **20** to rest in an angular relationship with respect to the shank **18**.

Looking more specifically at the other figures, the crown 24 of the anchor 19 is shown having a brace 28 affixed between the plates 26. The brace can be welded or attached to the crown 24 of the anchor 19 by means of rivets 29. However, any suitable means can be utilized to affix the brace 28 across the crown of the anchor 19.

Any type of Danforth anchor, patent anchor, mushroom anchor, or grapnel anchor can be utilized with this invention. In any instance, a brace similar to the brace 28 is utilized to affix a spindle 30 or other projection at the crown 24 of the anchor 19. The spindle 30 is provided with a recessed annulus or circumferential groove 32 near a rounded end 34 thereof. The annulus 32 receives a plurality of detents 36 which are spring biased for outward radial movement away from the spindle 30.

A mushroom, bellshaped or discshaped anchor 38 is shown which provides the function of an auxiliary anchor. The auxiliary anchor 38 has a shaft 40 which is made from metal having sufficient spring steel qualities to operate spring loaded detents 36. The end of the shaft 40, distal from the disc end 43, has a bellshaped opening 41 for receiving the spindle 30 and acting as a stop for the collar 42. The shaft 40 is provided with a pair of detents 36 which have been pressed from the material of the shaft 40 and are biased outwardly away from the axis of the shaft. The detents 36 have a catch point 39 which is formed to seat within the annulus 32 of the spindle 30. The detents 36 can be formed or pulled away from the axis of the shaft 40 during manufacture so that the detent points 39 will tend to return to a point outside the inner circumference of the shaft 40.

Surrounding the shaft 40 is a circumferential collar 42 to which is attached a line 44. The circumferential collar 42 can be formed from any suitable metal or other material which will slide down over the detents 36 and force them into a locked relationship with the annulus 32. The line 44 may be attached in any suitable manner to the collar 42 such as by a loop 46 attached to the collar for looping the line 44 therethrough.

As seen in FIGS. 2 and 3 , the shaft 40 is placed over the spindle 30 and locked thereto by virtue of the detents 36 being held by the collar 42 in juxtaposed relationship with the annulus 32. In this manner the auxiliary anchor 38 cannot be slid off the spindle 30 and is held in affixed relationship to the crown 24 of the anchor 19. When the collar 2 is removed by tension on the line 44 pulling the collar from over the detents 36, the auxiliary anchor 38 is in a position whereby it can slide off the spindle 30 when the main anchor 19 is moved from a fixed position related to the auxiliary anchor 38.

The line 44 is wound around a windlass 12 which comprises a reel 50 with a crank 52 affixed in axial relationship for winding the reel 50. The reel has a shaft 54 and a pair of 9 flanges 56 and 57 at either end. The flanges 56 and 57 have eccentric surfaces 58 so that when they move about an axle 60 which is attached to the crank 52, they will generate an eccentric circumferential motion about the axle. The axle 60 is mounted to a bracket 62 which can be in the form of a box of an upstanding U-shaped bracket. Beneath the flange 57 is a microswitch 68 which generally comprises a loaded roller 70 attached to a lever 72 on a pivot point 74 with the lever overlying a contact actuating button 76. The microswitch 68 has a pair of attachment leads 78 and 80 which are in a circuit shown in FIG. 7.

The circuit of FIG. 7 shows the microswitch 68 with the leads 78 and 80 connected to a source of energy such as a battery 82 with an incandescent light 84 and a horn 86. When the switch 68 is closed across the connection points 78 and 80, the incandescent light 84 is lit and the horn 86 causes an audio signal to emanate therefrom.

In operation, an anchor 19 is thrown overboard with the auxiliary anchor 38 attached to the spindle 30 by means of the detents 36 having their points 39 in locking relationship with the annulus 32. This is accomplished by the collar 42 overriding the detents 36. As the anchor chain 14 pays out, the anchor 19 with the auxiliary anchor 39 eventually lands against the bottom and the flukes 20 dig into the bottom as the slack in the chain 14 is taken up. When the anchor 19 is paid out, the line 44 is paid out along with it and the auxiliary anchor 39 lands in a position in proximate relationship to the crown 24 of the anchor.

After the anchor 19 has dug into the bottom sufficiently and the boat has been secured to the point where it does not drift, the line 44 is pulled into a taut relationship by the crank 52 attached to the reel 54. As the reel 54 tightens the line 44, it removes the collar 42 overlying the detents 36. In this manner, the shaft 40 is free to move over the spindle 30, should the spindle move backwardly from the shaft.

When the anchor 19 is placed in the position with the bell or disc 43 of the auxiliary anchor 38 in juxtaposition thereto, the surface or periphery of the auxiliary anchor 38 digs into the bottom. Thus, as the anchor 19 is slid backwardly away from the auxiliary anchor 38 by reason of it drifting, the auxiliary anchor remains in its original position and the anchor slides away from it.

As the line 44 begins to become taut and the auxiliary anchor 38 holds to the bottom, the reel 54 begins to turn about its axle 60. As the reel 54 turns about its axle 60, the eccentric flange 57 begins to turn about its axis and contacts the roller 70 of the microswitch 68. As it contacts the roller 70 it pushes the switch contact 76 so that the circuit in FIG. 7 is completed. In this manner, a visual warning can be displayed as well as an audio warning issued from the horn 86, indicating that the anchor 19 is slipping. As the anchor 19 slips, the auxiliary anchor 38 continues to hold because of the fact that the relative motion of the boat 10 with respect thereto does not cause the reel 54 to have any substantial pulling force upon the line 44. Inasmuch as the axle 60 is free to rotate, the auxiliary anchor 38 will generally maintain its original position in which it was placed with respect to the anchor 19 and cause a warning to be issued to those on deck.

The greater number of times contact is made by virtue of the eccentric 57 contacting the roller 70 and depressing it against the contact switch 76, the greater number of visual or audio signals will emanate in a given period of time. Thus, one can tell how fast the anchor 19 is being dragged by virtue of the fact that a fast or slow signal repetition will indicate the speed of the anchor 19 dragging.

Other brackets 62 can be utilized to hold the axle 60 with the reel 54 thereon. Furthermore, integral units

can be included and combined with the brackets such that the battery **82**, horn **86** and visual indication **84** are mounted as an integral unit on the winch **12**. The circuit shown in FIG. **7** may be utilized with the ships horn, or other light. In this manner, the bracket **62** is mounted with its respective connection points **78** and **80** within the horn circuit of a boat to provide the same function without providing a specific horn **86** extrinsic to that of the boat.

Other modifications can include different catch points and releasable linking members other than the detents **36**, depression, hollow or annulus **32** and sliding collar **42**. For instance, any releasable means to hold the anchor **19** and auxiliary anchor **38** in juxtaposition until the anchor is secured on the bottom may be utilized.

It should be apparent that other alternative embodiments may be adapted to the scope and spirit of this invention as claimed.

I claim:

1. A boat anchor drift warning device comprising in combination with a boat anchor:
- an An auxiliary anchor;
- means for affixing said auxiliary anchor to said boat anchor in a separable manner comprising: a projection from said boat anchor, and holding means for connecting said projection to said auxiliary anchor;
- a line affixed to said auxiliary anchor; and
- means for indicating movement of said line with respect to said boat.

2. A boat anchor drift warning device as claimed in claim **1** wherein said means for indicating movement of said line with respect to said boat comprises:
- a windlass having an eccentric;
- means beneath said eccentric for detecting when the windlass is rotating; and
- means attached to said detection means for issuing a signal.

3. A boat anchor drift warning device as claimed in claim **2** wherein said means for sensing rotation of the eccentric of said windlass comprises:
- a microswitch for actuation by said eccentric of said windlass; and
- a circuit connected to said microswitch within which a horn is connected with a suitable source of electrical power for driving said horn.

4. A boat anchor drift warning device as claimed in claim **1** wherein said means for affixing said auxiliary anchor to said boat anchor in a separable manner further comprises:
- a moving fixture connected to said line for releasing said holding means from said projection upon movement of said fixture.

5. A boat anchor drift warning device as claimed in claim **4** wherein said catch means comprise:
- spring biased detents; and
- said moving fixture comprises a collar for sliding over said spring biased detents.

6. A device for detecting the drift of a boat anchor comprising:
- an auxiliary anchor;
- means to separably connect said auxiliary anchor to the boat anchor;
- means to actuate said separable connection means to permit separation of said auxiliary anchor from said boat anchor;
- a line attached to said actuation means;
- a reel mounted to the deck of a boat attached to said line; and
- means for detecting rotation of said reel to provide a warning when said line is being paid out.

7. A device for detecting the drift of a boat anchor as claimed in claim **6** wherein said means to separably connect said auxiliary anchor to the boat anchor comprises:
- a projection from said boat anchor;
- a depression on said projection;
- means on said auxiliary anchor to affix said auxiliary anchor with respect to said depression; and
- a moving fixture to release said auxiliary anchor affixing means from said depression.

8. A device for detecting the drift of a boat as claimed in claim **7** wherein said depression comprises:
- a hollow with a catch point on said projection; and
- said auxiliary anchor affixing means comprises a collar in overlying relationship to spring biased members for seating in said depression.

9. A device for detecting the drift of a boat anchor as claimed in claim **8** wherein said affixing means comprise:
- spring biased detents formed within the shank of said auxiliary anchor for affixing to said catch point; and
- said collar is suitably connected for sliding over said spring biased detents to cause them to latch to said catch point.

10. A device for detecting the drift of a boat anchor as claimed in claim **9** wherein said auxiliary anchor comprises:
- a bell-shaped anchor.

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