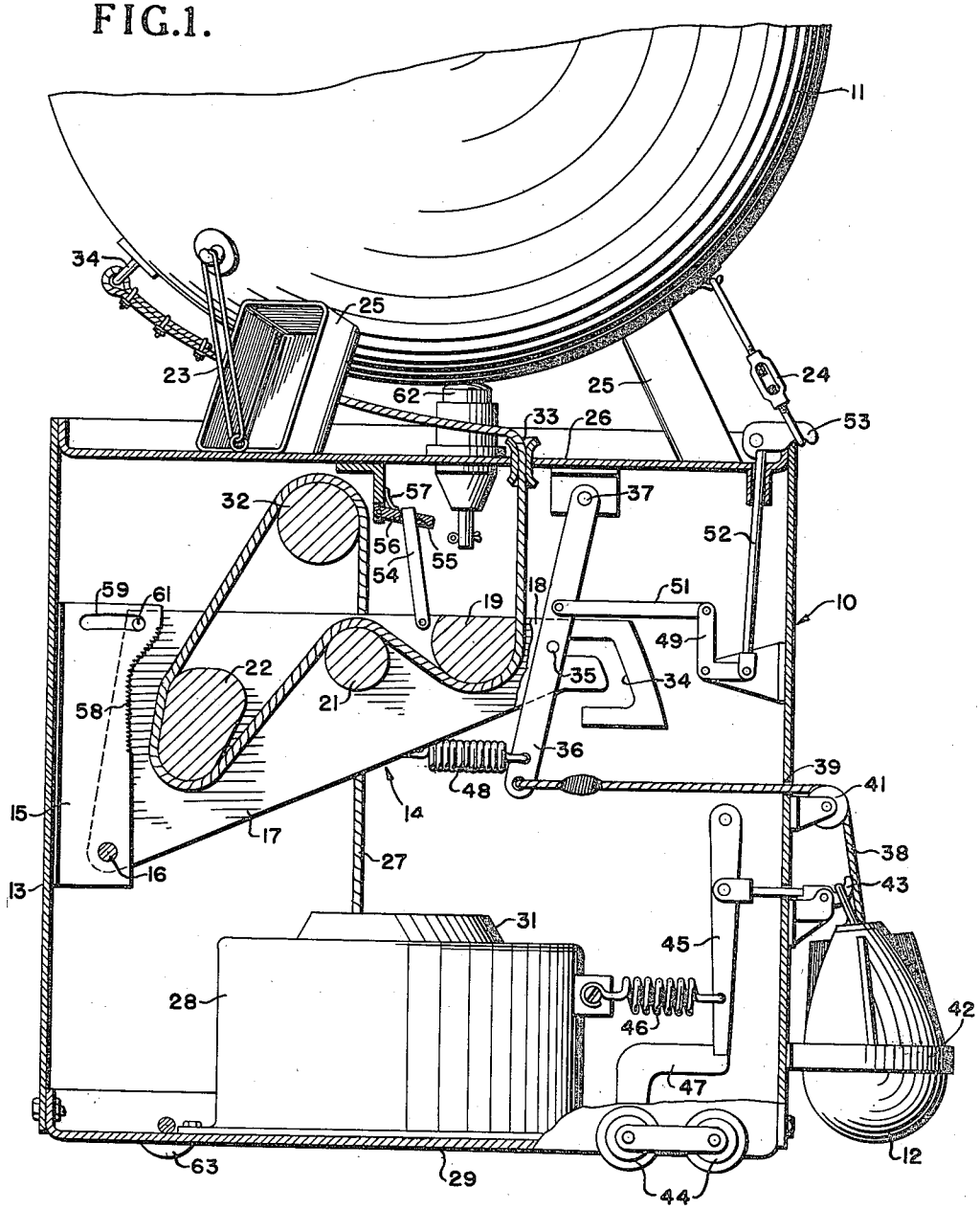
Nov. 19, 1957 J. C. GOFF 2,813,486

CABLE SNUBBING AND LOCKING APPARATUS FOR MOORED MINE

Filed May 2, 1952 2 Sheets-Sheet 1

FIG.1.



INVENTOR
JOHN. C. GOFF

BY

G. D. O'Brien.
R. M. Hicks.

ATTORNEYS

Nov. 19, 1957 J. C. GOFF 2,813,486

CABLE SNUBBING AND LOCKING APPARATUS FOR MOORED MINE

Filed May 2, 1952 2 Sheets-Sheet 2

FIG.2.

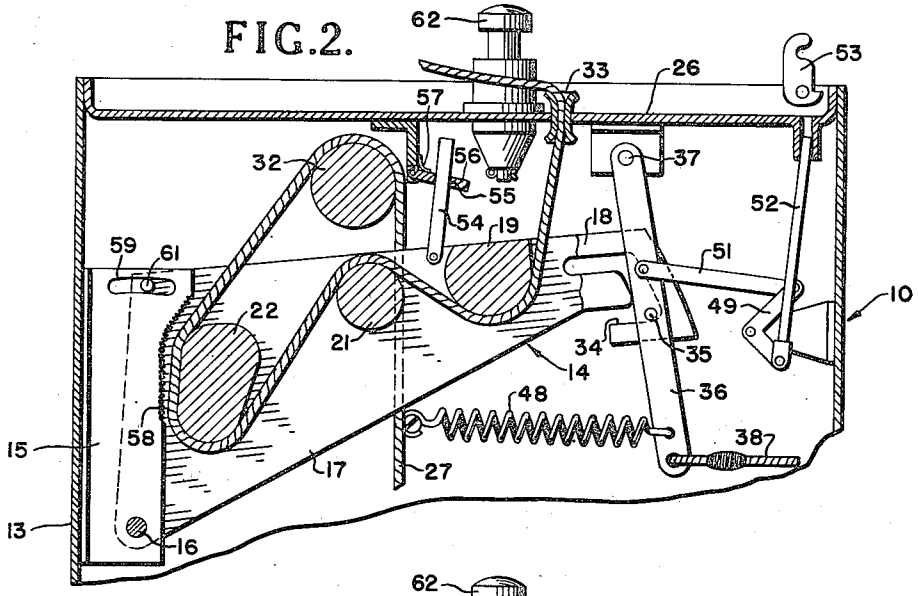


FIG.3.

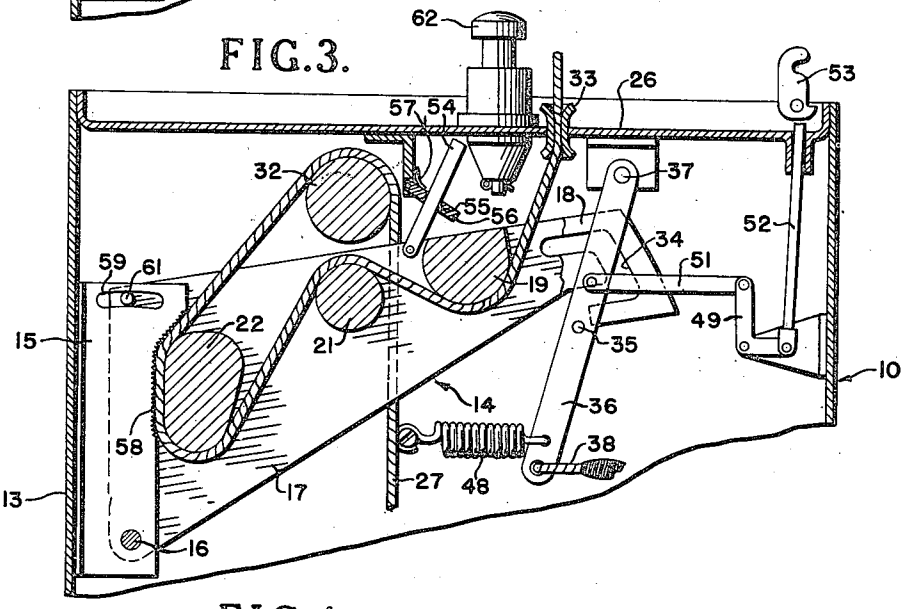
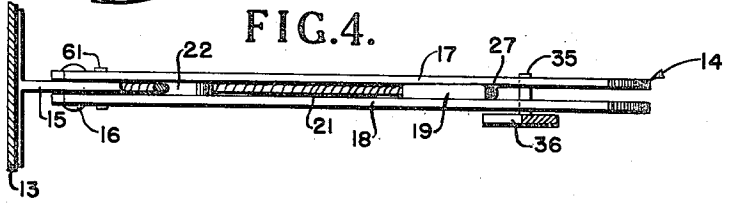


FIG.4.



INVENTOR
JOHN C. GOFF

BY

ATTORNEYS

United States Patent Office 2,813,486
Patented Nov. 19, 1957

2,813,486

CABLE SNUBBING AND LOCKING APPARATUS FOR MOORED MINE

John C. Goff, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Navy

Application May 2, 1952, Serial No. 285,783

6 Claims. (Cl. 102—13)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to anchors for moored buoyant mines and more particularly to an improved mechanism for snubbing the anchor cable thereof as it is payed out during the launching of the mine and to lock the cable against further paying out as the plummet of the anchor strikes the bottom of a body of water.

In devices of the prior art, it has been found difficult to provide for snubbing and locking the cable in an efficient, simple and positive manner as in the device of the present invention.

An object of the present invention is to provide a new and improved cable snubbing and locking device for a mine anchor which is simple and well adapted to the purpose.

Another object is to provide a cable snubbing and locking device for a mine anchor which has an improved mechanism for ensuring proper sequential operation.

Still another object is to provide a cable snubbing and locking device for a mine anchor which is well adapted for use with the plummet mechanism and mine releasing mechanism of the mine anchor.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 is a vertical sectional view of a mine anchor in accordance with the present invention and showing the snubbing and locking mechanism in the initial position;

Fig. 2 is a view showing the snubbing and locking mechanism in the position assumed thereby after the plummet and mine have been released from the anchor;

Fig. 3 is a view similar to Fig. 2 and showing the mechanism in the cable locking position assumed after the plummet comes to rest on the bottom; and

Fig. 4 is a top plan view of the snubbing and locking mechanism per se.

Referring more particularly to the drawings wherein like numerals indicate like parts throughout the several views, 10 indicates generally an anchor for a marine mine 11 and having a plummet 12 suspended on one side of the anchor 10.

Anchor 10 comprises a casing 13 having mounted therein, on one wall thereof, a snubbing and locking mechanism indicated generally at 14. A mounting portion 15 thereof is fixed to the wall, as aforesaid. The portion 15 has pivotally mounted thereon as at 16 a pair of members 17 and 18. Mounted between the members 17 and 18 and fixedly secured thereto are the snubbing members 19 and 21 and a snubbing and locking member 22.

As shown particularly in Fig. 1 of the drawings, the mine 11 is secured to anchor 10 by link devices 23 and releasable turnbuckle 24, the mine resting on supports 25

fixedly secured on top plate 26 of anchor 10. A length of anchor cable 27 is coiled within cable dispenser 28 mounted within anchor 10 on bottom plate 29 thereof.

Cable 27 extends out of mouth 31 of dispenser 28, over roller 32 mounted above mechanism 14, around the far side of and under snubbing and locking member 22, over member 21, under member 19, up through grommet 33 in top plate 26 and thence extends to and is fastened to eye 34 which is secured to mine 11. It will thus be seen that when mine 11 is released from anchor 10 cable 27 will be drawn out of dispenser 28, the snubbing members 19 and 21 and the snubbing and locking member 22 preventing cable from being payed out too rapidly, thus avoiding formation of kinks and tangles in the cable.

At least one of the members 17 and 18 is provided with a substantially C-shaped guide slot 34 to receive pin 35 extending laterally from lever 36. Lever 36 is pivotally secured as at 37 to the inner side of plate 26. One end of plummet cable 38 is secured to the lower end of lever 36 and extends through opening 39 in casing 13, over pulley 41 and into plummet 12 where a measured length of the cable 38 is stored. Plummet 12 is restrained against lateral motion by a strap member 42 and locked against release from anchor 10 by locking device 43 which is released as the roller assembly 44 of the anchor runs off the end of the launching trackway (not shown) as is well known in the art. Locking device 43 is connected to lever 45 which is urged to the release position by a spring 46 and initially held in the locking position by latch 47 which pivots with roller assembly 44 as the mine is launched to release lever 45 and the plummet 12.

Lever 36 is urged in a direction away from pulley 41 by a spring 48.

As the plummet falls away from anchor 10 tension is placed on lever 36 rocking the lever in opposition to spring 48 and moving pin 35 to the opposite end of the top horizontal run of C-slot 34. Simultaneously therewith bell crank lever 49 is rocked by movement of link 51 which connects one end of lever 49 with lever 36. A vertical keeper 52 connected to the other end of lever 49 extends outwardly of top plate 26 and releases latch hook 53 as lever 49 is rocked. Turnbuckle 24 slips off of hook 53 as the hook is released thus releasing the mine 11 from the anchor 10.

As mine 11 is released and begins to separate from the anchor, cable 27 is drawn out of dispenser 28, over roller 32 and the snubbing members 19, 21 and 22, this action causes member 17 to move upwardly the distance of the vertical run of C-slot 34, the pin 35 of lever 36 bearing against the lower wall of the lower horizontal run of the C-slot.

As member 17 moves to the raised position, a rod 54 formed of soft metal moves through bore 55 of pivoted plate 56 formed of hard metal and which grips the rod 54 when tilted by spring 57, the rod being permitted by the aforedescribed apparatus to move through plate 56 in only an upward direction, thus preventing the return of mechanism 14 to the initial position after having moved out of said position. Cable 27 continues to pay out until plummet 12 strikes the bed of the body of water, whereupon tension on the cable is relieved and the lever 36 moves under influence of spring 48 to bring pin 35 out of the lower run of C-slot 34 thus releasing mechanism 14 upwardly, impinging cable 18 between serrated curved surface 58 of portion 15 and the upper curved edge of member 22 thus securely wedging and locking the cable against further paying out.

As shown in the drawings, the portion 15 may be provided with an arcuate slot 59 through which a bolt or pin 61, fixedly secured to members 17 and 18, passes thus limiting movement of mechanism 14.

Anchor 10 may be provided with a flooding valve 62

for the purpose of flooding the anchor with water after the mine has been separated therefrom.

It is also understood that besides the rollers **44**, anchor **10** is provided with other rollers **63**.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed and desired to be secured by Letters Patent of the United States is:

1. Control apparatus for a moored mine comprising, in combination, an anchor having a plummet for said mine, a length of cable connected at one end thereof to the mine and at the other end thereof to the anchor, a pair of spaced plates pivotally mounted at one end thereof for movement from an initial position through an intermediate position to a gripping position, a plurality of snubbing members fixedly fastened to said plates and mounted therebetween, said cable passing alternately under and over said snubbing members, a cable dispenser mounted within said anchor and in which said cable is stored, a gripping member fixedly mounted in said anchor in spaced relation to one of said snubbing members when said snubbing member is in the initial and intermediate positions thereof and engaging the cable in gripping relation with the snubbing member when said snubbing member is in the gripping position, a C-slot formed in said plates, a lever pivotally mounted on said anchor and having a pin disposed within said C-slot for holding said snubbing members in said positions, a plummet cable carried by the plummet and connected to said lever for actuating said lever and moving said pin within the C-slot thereby releasing said members from the initial position to the intermediate position as the plummet reaches the end of the plummet cable, and means connected to said lever for moving the lever sufficiently to disengage the pin from the C-slot and release the members for movement from said intermediate position to the gripping position as the plummet strikes the bottom.

2. Apparatus for snubbing and locking the anchor cable of a moored mine comprising in combination, an anchor releasably secured to said mine, means within said anchor for storing a length of said cable, the cable extending out of said anchor, means for securing the cable to the mine, snubbing means interposed between said storing means and said mine for limiting the rate at which the cable is payed out as the mine and anchor are separated, said snubbing means being supported for pivotal movement within said anchor and having a snubbing element secured near the free end thereof about which the anchor cable is disposed for imparting upward movement thereto, a substantially C-shaped slot in said snubbing means at the free end thereof, a spring-urged lever pivotally mounted in said anchor and having a pin fixed thereto, said pin initially extending through said C-shaped slot, said C-shaped slot having upper and lower horizontal runs and a connecting vertical run, a plummet for said anchor and releasably mounted thereon, a cable mounted in said plummet for paying out therefrom when the plummet is released, means on said anchor for releasing said plummet as the mine and anchor are launched, means connected to said lever for releasing said mine as the plummet is released, said plummet cable being attached to the free end of said lever whereby when the plummet is released the lever is moved by the weight of the plummet until said pin reaches the vertical run of said slot and the snubbing means moves upwardly an amount sufficient to maintain the pin in locking engagement with the lower run of said slot and thereby release said snubbing means as the anchor cable becomes taut after the mine and anchor are separated, said spring-urged lever moving the pin out of the lower run of the C-slot to release said snubbing means when tension on the plummet cable is released by the plummet striking the bed of a body of water, means fixed in said anchor for engaging said anchor cable as the cable is gripped between the engaging means and the snubbing means when the snubbing means is in the released position.

3. In an anchor for a moored mine, the combination of, a device for storing a length of mooring cable and for dispensing the cable therefrom as the anchor sinks in the water after launching, a plurality of snubbing elements engaging said cable and interposed between the dispensing device and the mine, an initially locked movable member supporting said snubbing elements and movable from the initial position to a cable clamping position as said movable member is released, a plummet having a plummet line carried thereby, controlled means connected to said plummet line for releasing said member from said initial position in response to a sudden tension on the line when a predetermined length of said line has been payed out, a C-slot formed in said movable member, pin means on said releasing means and disposed within said C-slot for holding the member in the initial position, means on said anchor coacting with one of said snubbing elements for clamping the cable therebetween as the movable member moves to the clamping position, and means secured to said casing and said releasing means for disengaging said pin means from said C-slot and thereby releasing the member for movement to said clamping position in response to a decrease in tension of the line as the plummet strikes the bottom of a body of water.

4. The combination of a buoyant mine casing and an anchor releasably secured thereto, said anchor including a housing, a cable dispenser mounted in said housing, a length of mooring cable stored in said dispenser and extending through said casing and secured to said mine casing, a normally locked supporting beam pivoted at one end thereof and having a plurality of snubbing members mounted thereon, said cable being trained alternately under and over said snubbing members whereby a force is exerted thereby to cause movement of the supporting beam when the cable is payed out, a member secured to said anchor housing and having a gripping surface in spaced relation to one of said snubbing members whereby movement of said supporting beam will move said one of said snubbing members toward said gripping surface for gripping the cable therebetween, a plummet releasably mounted on said anchor housing, means for releasing said plummet, a control lever pivotally mounted in said housing, a line connected to said control lever and to said plummet, means operably connected to said control lever for releasing said mine casing from said anchor, a pin on said control lever engaging said supporting beam for regulating the movement thereof whereby said mine is released from said anchor and the cable is payed out from said dispenser on movement of said control lever in one direction, a C-slot formed in said beam in engagement with said pin for causing the control lever to move in one direction as the plummet reaches the end of the line and a sudden tension is applied to said line, means connected to said casing and the control lever for moving said control lever in the opposite direction sufficiently to disengage said pin from said C-slot and thereby release the beam as said plummet strikes the bottom and said tension on the line is relieved, and means for locking said beam against movement from the intermediate position to the initial position and from the gripping position to the intermediate position.

5. Apparatus for snubbing and locking the anchor cable of a moored mine comprising, in combination, an anchor releasably secured to said mine, said cable being secured to the mine at one end thereof and to the anchor at the other end thereof, a receptacle mounted in said anchor, a quantity of said cable being stored in said receptacle for paying out therefrom as the anchor is released from the mine, a plummet for said anchor and having a length of line secured thereto, a release mechanism for said plummet operative as the mine is launched, a normally locked

snubbing structure comprising a pair of spaced supporting beams pivotally supported at one end thereof and having a plurality of snubbing members fixedly secured therebetween, a roller mounted above said snubbing structure for receiving said cable, said cable passing from said receptacle over said roller and alternately under and over said snubbing members and thence to the mine, a C-slot formed in said snubbing structure at the free end thereof for providing step motion to said structure and the initial, intermediate, and gripping positions thereof are provided, an actuating lever connected to said plummet for operation thereby, a pin carried by said actuating lever and disposed within said C-slot for controlling said step motion whereby the snubbing structure is moved from the initial to the intermediate position when the plummet reaches the end of the line after the release thereof, means connected to said actuating lever for releasing said structure as the lever is moved sufficiently to disengage the pin from said C-slot whereby said structure is moved from the intermediate to the gripping position when the plummet strikes the bottom, and a gripping member fixedly mounted in said anchor and adjacent the pivoted end of said snubbing structure whereby the cable is gripped between one of the snubbing members and said gripping member to lock the cable against further paying out as said structure is moved to said gripping position.

6. Apparatus for controlling the paying out of a mooring cable for a buoyant marine mine comprising, in combination, an anchor for said mine, a plummet for said anchor and having a plummet wire secured thereto, a dispensing device for storing a quantity of said cable, a

normally locked cable snubbing device mounted in said anchor, said snubbing device being pivoted at one end thereof and having a C-shaped slot at the other end thereof, a plurality of snubber members fixedly mounted in said snubbing device and movable therewith, a roller mounted above said snubbing device, said cable passing from the dispensing device over said roller and alternately under and over each of the plurality of snubber members, out of the anchor and thence to the mine, a lever pivotally mounted on said anchor connected to said plummet wire, a pin fixed to said lever and disposed in said C-shaped slot for locking said device in an initial snubbing position and an intermediate snubbing position until the plummet reaches the end of the wire and said lever is moved an amount sufficiently thereby to disengage the pin from said C-slot, spring means connected to said lever for moving the lever and releasing the snubbing device for movement from the intermediate position to the gripping position when the plummet strikes the bottom of a body of water, and a gripping member fixedly mounted in said anchor adjacent the pivoted end of said snubbing device, said cable being gripped between one of said snubber members and said gripping member to prevent further paying out of the cable when the snubbing device is in said gripping position.

References Cited in the file of this patent

FOREIGN PATENTS

760,764	France	Dec. 27, 1933
510,849	Great Britain	Aug. 9, 1939