June 6, 1933. W. A. HAUSENFLUCK 1,912,366

MECHANISM FOR DROPPING AND WEIGHING BOAT ANCHORS

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Fig.1.

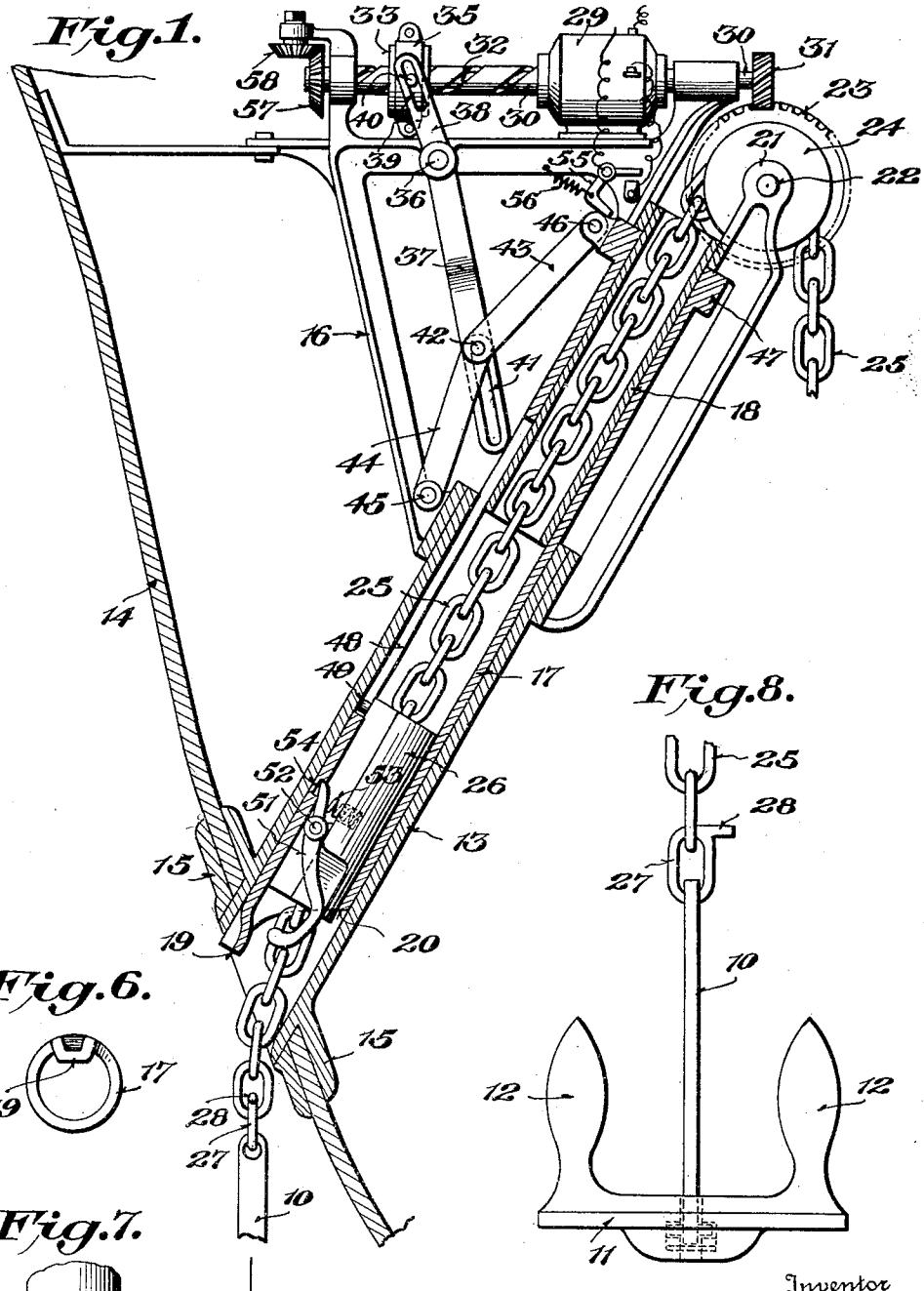


Fig.6.

Fig.7.

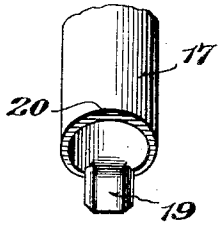


Fig.8.

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Fig. 2.

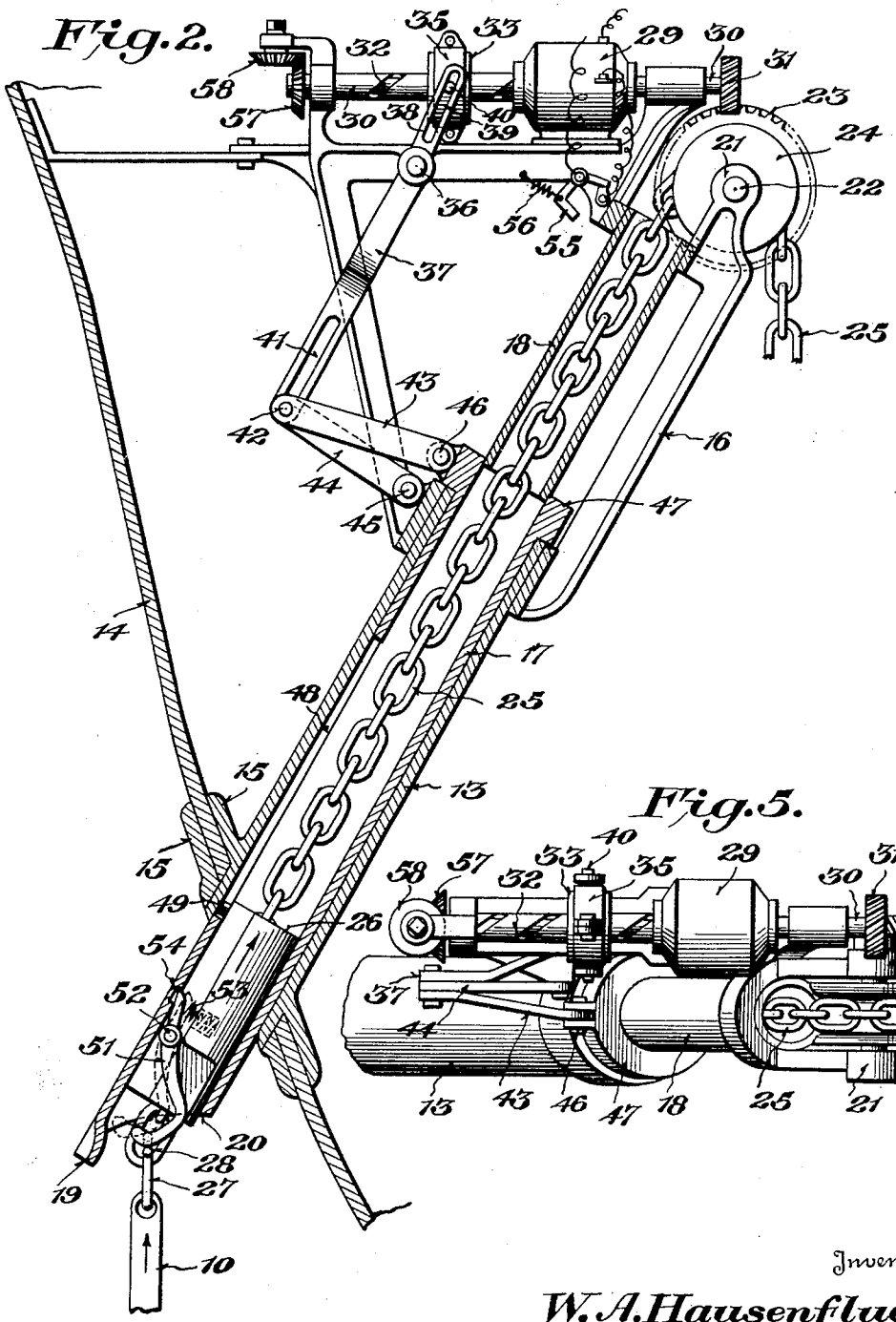


Fig. 5.

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MECHANISM FOR DROPPING AND WEIGHING BOAT ANCHORS

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Fig. 3.

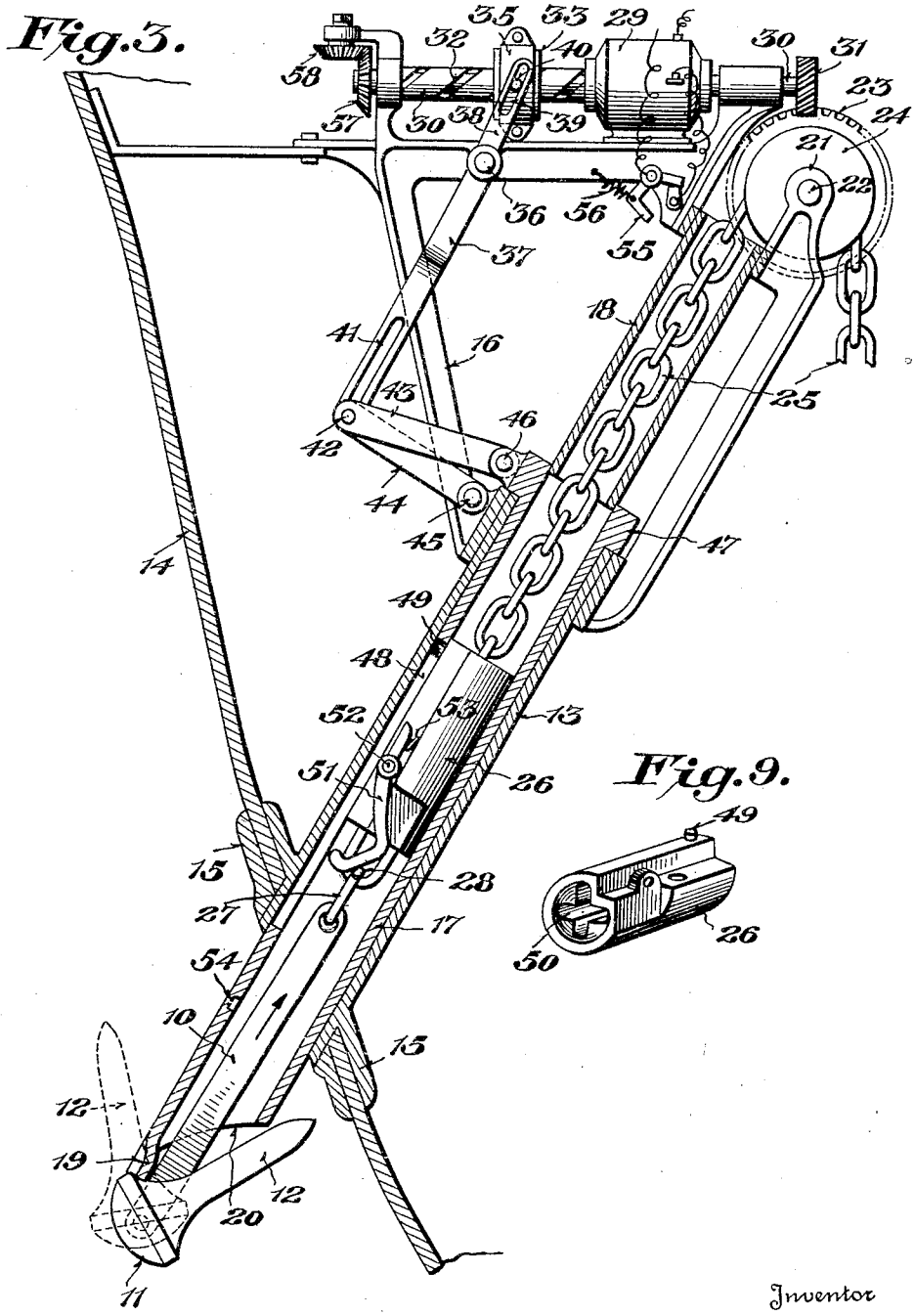


Fig. 9.

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MECHANISM FOR DROPPING AND WEIGHING BOAT ANCHORS

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Fig. 4.

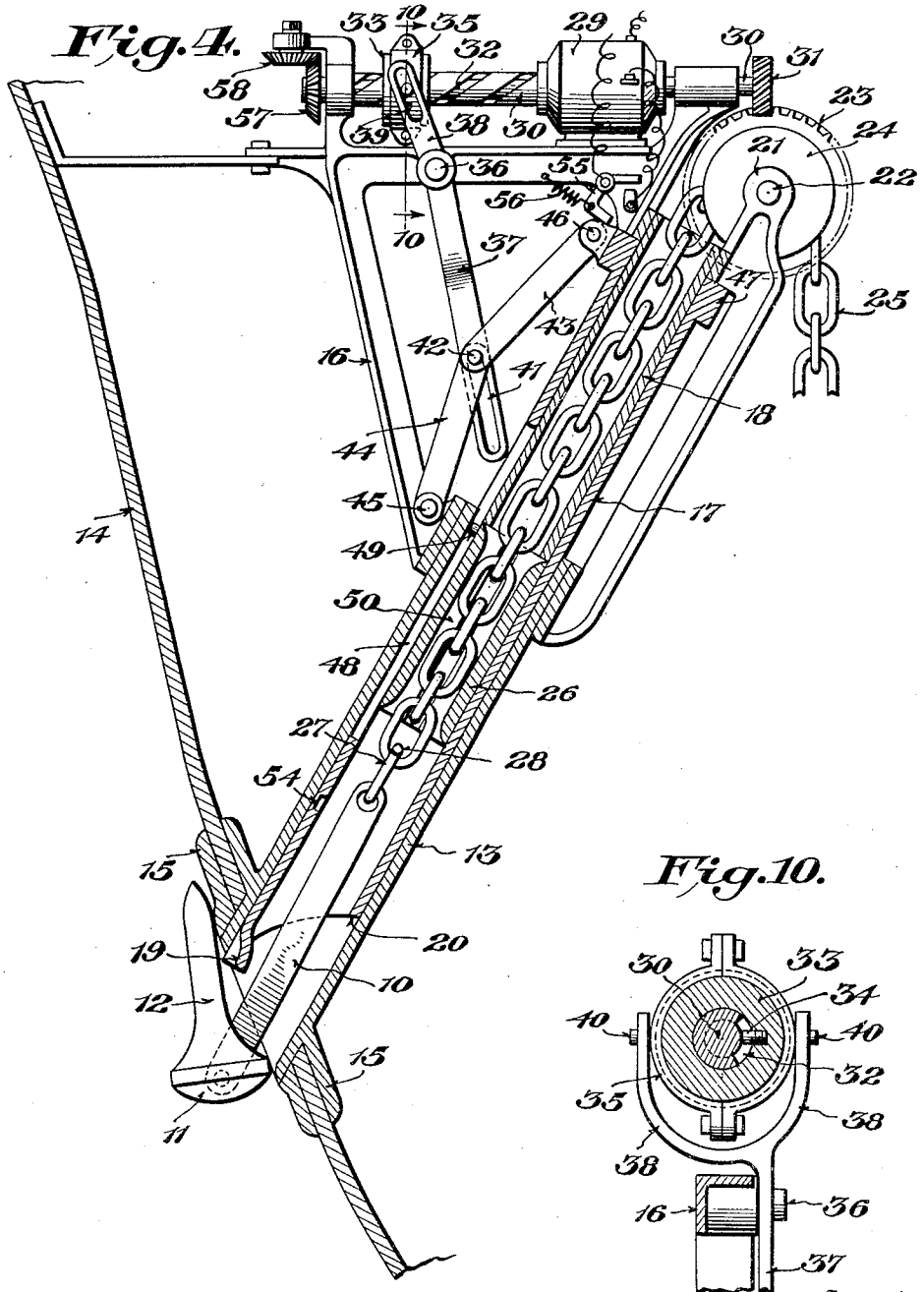


Fig. 10.

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UNITED STATES PATENT OFFICE

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MECHANISM FOR DROPPING AND WEIGHING BOAT ANCHORS

Application filed January 6, 1932. Serial No. 585,080.

This invention relates to a mechanism for weighing and dropping boat anchors, particularly anchors of the so-called "Navy" type which are characterized by the lack of a stock or cross bar at the chain end of the shank and by the provision of a pivoted head having flukes at opposite sides of the shank disposed in a common plane, and has for its general object to provide a mechanism which is effective during weighing of an anchor of the character mentioned, and as the anchor approaches the side of the boat, to swing the flukes thereof upward and outward to avoid any possibility of the pointed ends of the flukes digging into or otherwise marring the boat's side.

According to the invention, a fluke swinging device is projected from the side of the boat as weighing of the anchor is initiated and is held projected until upward and outward swinging movement of the flukes has been effected whereby any possibility of the ends of the flukes digging into the boat's side is avoided, and in this connection special objects of the invention are: To provide novel means to hold the fluke swinging device against projection during lowering of the anchor and while the boat is anchored, thereby to avoid an undesirable projection extending from the boat's side during such times; to provide novel means to effect projection of the fluke swinging device as raising of the anchor is initiated, and to hold the same projected until the flukes have been swung; and to provide novel means whereby movement of the anchor to a stowed position, following upward and outward swinging of the flukes thereof, effects retraction of the swinging device, thereby to avoid any possibility of the flukes dropping to a position in which they might dig into the boat's side during the final weighing movement of the anchor.

Another object of the invention is to provide a mechanism having the general mode of operation set forth and which is compact, strong and durable, which is of relatively inexpensive and simple construction, and which is positive, reliable and highly efficient in operation.

With the foregoing and various other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

In the drawings, wherein like characters of reference denote corresponding parts in the different views:—

Figure 1 is a section through a part of a boat's hull showing the present anchor weighing and dropping mechanism operatively applied to the hull and with the parts of the mechanism in the relative positions they assume when the anchor is dropped.

Figure 2 is a view similar to Figure 1 illustrating the relative positions assumed by the parts of the mechanism as weighing of the anchor is initiated and during weighing, but prior to swinging of the anchor flukes.

Figure 3 is a view similar to Figures 1 and 2 illustrating the manner in which the anchor flukes are swung upward and outward during the final portion of the weighing movement of the anchor.

Figure 4 is a view similar to Figures 1 to 3 illustrating the anchor stowed.

Figure 5 is a plan view of the mechanism.

Figure 6 is an end view of the fluke swinging element of the mechanism.

Figure 7 is a plan view of the fluke swinging element of the mechanism.

Figure 8 is an elevation of the anchor.

Figure 9 is a perspective view of the chain guide element of the mechanism; and

Figure 10 is a detail section on the line 10—10 of Figure 4.

While the mechanism constituting the present invention is capable of use on boats of various different types and sizes it is especially adapted for use on pleasure boats of the cruiser type to eliminate the disagreeable and difficult task of dropping and weighing anchor manually.

The anchor in most common use is the so-called "Navy" anchor characterized, as aforesaid, by the lack of a stock and the provision

of a pivoted head which is inclusive of flukes located at opposite sides of the shank and disposed in a common plane, the popularity of this type of anchor being due principally to the fact that it does not occupy much space when stowed, and is easily stowed, and to the fact that it holds well due to the flukes being capable of only limited pivotal movement relative to the shank and to their consequent tendency to dig farther into the bottom of a water body as the pull on the anchor is increased. However, since it is natural that the flukes of an anchor of the type mentioned should lean towards the side of the boat when the anchor is being weighed, it practically always happens that the pointed ends of the flukes strike against or dig into the side of the boat and leave ugly scars unless considerable care is exercised in weighing the anchor, or unless some special means is provided to hold the anchor away from the boat's side. Accordingly, while the present invention has primarily in view to provide a power mechanism for dropping and weighing anchors, it also has in view to provide a mechanism which will serve to prevent scarring or damaging contact of the anchor with the boat's side during dropping and weighing of the anchor.

A so-called "Navy" anchor of the type heretofore discussed comprises, as illustrated in the drawings, a stockless shank 10 and a fluked head 11 pivoted to the outer end of the shank for limited swinging movement relative thereto, whereby the flukes, designated as 12, are swingable between the full and dotted line positions substantially as illustrated in Figure 3 of the drawings.

Referring now particularly to the present specific embodiment of a mechanism which is constructed, and designed for operation, in accordance with the general principles of the invention, it will be observed that the same is inclusive of a tube 13 which extends at its lower end through an opening suitably located in the boat's side 14 and which is suitably secured rigidly to the boat's side at this point as, for example, by means of cooperating flanges 15 respectively engaging the inner and the outer faces of the side 14. This tube 13 which is of appropriate length, is disposed within the hull of the boat at a downward and outward inclination and at its upper end is effectively braced by a suitably stayed and substantially rigid framework designated generally as 16.

Within the tube 13 is slidably mounted a fluke swinging tube 17 which, at its upper or inner end, is slidably engaged over a guide tube section 18 fixed at its upper end to an upper part of the frame 16, and which, at its lower or outer end is suitably provided, at the top side thereof, with a tongue 19 for engagement with the head 11 of the anchor to effect upward and outward swinging movement thereof in a manner which will hereinafter become more clearly apparent. Below the tongue 19 the tube 17 is cut away, as indicated at 20, to avoid any interference with swinging of the anchor head by said tongue.

Journaled in bearings 21 carried by the framework 16 is a horizontal shaft 22 on which is fixed a gear wheel 23 and a sheave wheel 24, the sheave wheel being disposed with one side thereof alined with the tubes 13, 17 and 18 and having engaged thereover the anchor chain 25 which extends from said wheel downwardly through the guide tube 18 and through a guide block 26 which is slidably mounted within the tube 17. From the guide block 26 the chain extends through the lower or outer end portion of the tube 13 and at its end is connected by a special link 27 with the shank 10 of the anchor, said link 27 having a laterally extending pin 28 for a purpose which will later appear.

Mounted on the framework 16 is a reversible electric motor 29 to the shaft 30 of which is fixed a gear 31 which is disposed in mesh with the gear 23. Accordingly, rotation of said motor in one direction is effective to pay out the chain 25 to lower the anchor, while rotation thereof in an opposite direction obviously is effective to pull in the chain to weigh the anchor.

A part of the motor shaft 30 is formed with a spiral groove 32 and has loosely mounted thereon an inertia member 33 in the form of a collar of suitable weight which is provided with a pin 34 disposed within the groove 32. Accordingly, in view of the tendency of said collar not to rotate when rotation is imparted to the motor shaft, the result is that when rotation of the motor shaft is initiated, said collar is caused to travel along said shaft.

Embracing the collar 33 is a band 35 within which the collar is rotatable, while pivoted at a point intermediate its ends, as at 36, to the framework 16 is a lever 37 having at one end thereof yoke arms 38 which embrace the band 35 and which have slots 39 in which are disposed pins 40 projecting from the band 35. Accordingly, movement of the collar 33 along the motor shaft is effective to rock the lever 37.

The second end of the lever 37 is formed with a slot 41 and has disposed within said slot a pin 42 which serves to pivotally connect together the adjacent ends of a pair of toggle links 43 and 44, one of which is pivoted at its other end to the framework 16, as at 45, and the other of which is pivoted at its other end, as at 46, to a band 47 fixed to the upper end of the tube 17. Therefore, rocking movement of the lever 37 in a counterclockwise direction, according to the particular structural arrangement illustrated in the present instance, obviously is effective to break the tog-

gle and to effect projection of the tube 17 in an outward direction through the tube 13. In this connection it is pointed out that when the anchor is in a lowered position the tube 17 is in a retracted position and that the arrangement of the parts of the mechanism is such that initiation of rotation of the motor in a direction to pull in the chain 25 to weigh the anchor is effective to move the collar 33 along the shaft 30 in a direction to swing the lever 37 to break the toggle 43, 44 and thus effect projection of the tube 17.

The tube 17 is held against rotation by the toggle arms 43, 44, or is held against rotation in any other suitable manner, and has formed therein a longitudinally extending slot 48 into which projects a pin 49 carried by the heretofore mentioned chain guide block 26. Accordingly, the block 26 is held against rotation, and inasmuch as the opening 50 that is formed through said block for the passage of the chain 25 therethrough is of cross-shape, as illustrated in Figure 9 thereby to hold the chain against rotation, it follows that whenever the chain is pulled to weigh the anchor the last link 27 of the chain always approaches the block 26 in a certain definite relation thereto, and that, likewise, the shank 10 of the anchor always enters the tube 17 in a certain definite relation thereto; i. e., with the pivot of the head 11 disposed horizontally.

The block 26 is suitably recessed exteriorly to accommodate a latch 51 which is intermediately pivoted to the block as at 52, and said latch is either of the gravity type or pressed by a spring 53 so that when the block is disposed within the lower or outer end portion of the tube 17 the inner end of the latch is caused to engage in a recess 54 formed in said tube whereby the block is held against inward movement relative thereto.

The block 26 is limited in its outward movement relative to the tube 17 by engagement of the pin 49 with the lower end of the slot 48, and when said block is disposed at its limit of outward movement, with the inner end of the latch 51 engaged in the recess 54, the outer end of said latch is disposed in the path of movement of the pin 28 carried by the chain link 27, whereby the latch is tripped and released only when, during pulling of the chain to weigh the anchor, the shank 10 of the anchor has entered the lower end of the tube 17.

Assuming that the anchor is overboard and that the parts of the mechanism are disposed relatively as shown in Figure 1; that is, that the tube 17 is in its retracted position that the block 26 is in its outermost position and is held in this position by the latch 52, and that the collar 33 is disposed on the motor shaft 30 in a position to be moved along said shaft in a direction to swing the lever 37 to break the toggle 43, 44 thereby to effect projection of the tube 17, when rotation of the motor in a direction to effect a pulling in of the chain 25 is initiated, the operation of the mechanism will be apparent and is as follows: A suitably located switch is operated to close the motor circuit to cause rotation of the motor in a direction to effect a winding in of the anchor chain by the sheave wheel 24, and as the motor starts to rotate at relatively high speed, due to its reduction gear connection with the sheave wheel 24, the collar 33 is shifted along the shaft 30 in a direction to swing the lever 37 to break the toggle 43, 44, thus to effect projection of the tube 17 outwardly through the tube 13 to the position shown in Figure 2. Now, since continued rotation of the motor shaft tends to continue the movement of the collar 33 along said shaft in the direction mentioned, the toggle is maintained broken and the tube 17 is maintained projected (in part by its own weight) while the anchor is being weighed. When, however, the link 27 of the chain 25 approaches the block 26, the pin or projection 28 of said link engages the outer end of the lever 51 and trips the same to effect its disengagement from the recess 54. Thereupon, the block 26 is moved with the chain upward into the tube 17 and serves to hold the chain and therefore the anchor shank against rotation, so that the anchor head 11 is caused to approach the tongue 19 in the manner aforesaid; i. e., with the pivot of the anchor head disposed substantially horizontally. Therefore, if the flukes 12 of the anchor are disposed, as they usually are, at an inward inclination relative to the anchor shank, as illustrated in full lines in Figure 3, the result of continued inward movement of the chain and the anchor is to cause the upper side of the anchor head to abut against the tongue 19 at the outer end of the tube 17, whereby further inward movement of the chain and the anchor is effective to cause the tongue 19, by resisting inward movement of the anchor head at the upper side thereof, to exert a lever action on said head resulting in the flukes 12 being flipped or swung upward and outward to the dotted line position shown in Figure 3. Now, inasmuch as the chain and the anchor can no longer move inward relative to the tube 17, it follows that any further inward movement of the chain and the anchor is effective to overcome the weight of said tube 17 and the tendency of the collar 33 acting through the toggle to hold said tube in its projected position, whereby the final portion of the weighing movement of the anchor is effective to retract the tube 17 into the tube 13. And, obviously, since inward movement of the tube 17 is effected because of engagement of the anchor head with the tongue 19, it follows that the flukes of the anchor are maintained in the dotted line position of Figure 3 until, finally, they come to rest against the outer

flange element 15, just prior to which time an upper end portion of the tube 17 engages and actuates a suitable switch 55 to break the motor circuit. Thus, the final relative position of the elements of the mechanism when the anchor is weighed is substantially as illustrated in Figure 4, in which position said elements are held by the toggle links 43, 44 and their associated parts.

Any suitable means may be provided to temporarily close the motor circuit to cause rotation of the motor in a direction to pay out the chain 25 to lower the anchor, whereupon a spring 56 operates to close the switch 55 to adapt the same for actuating to automatically open the motor circuit when the anchor again is weighed, and as the chain 25 is allowed to run out, the block 26 is carried with the chain and by its tendency to gravitate through the tube 17, to its lowermost position shown in Figure 1, whereby, upon subsequently closing the motor circuit to effect rotation thereof in a direction to weigh the anchor the operation just recounted is repeated.

To adopt the mechanism for manual operation in the event of failure of the motor to function, or in the event it is not desired to use the motor, or if a motor is not provided, the shaft 30 is equipped with a gear 57 having meshing therewith a gear 58 the shaft of which is suitably formed to accommodate a crank.

It will, of course, be understood that the circuit to the motor for controlling the movement of the anchor chain can be closed at any one of a number of points in the vessel, as for example, from the cabin, or elsewhere. An ordinary push-button or other type of switch may be used for the purpose and the necessary electrical energy for the motor may be supplied from storage batteries or other electrical source provided on the vessel.

The present invention also particularly lends itself to be incorporated in the structure of the vessel so that it may be concealed from view. That is to say, the mechanism for operating the anchor may be arranged beneath the deck so as to preserve the smart appearance of the boat and without necessitating the marring or cutting of completed boats in which it may be installed.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit of the invention and scope of the appended claims.

I claim:—

1. A mechanism to be carried by a boat for weighing anchors of the type having pivoted flukes comprising means operable to pull the anchor to a weighed position against the side of the boat, and means rendered effective by weighing movement of the anchor to swing the flukes thereof outwardly relative to the side of the boat thereby to prevent the ends of the flukes from contacting with the boat.

2. A mechanism to be carried by a boat for weighing anchors of the pivoted fluke type comprising means operable to pull the anchor to a weighed position against the side of the boat, and means projectible from the boat by actuation of the mechanism to weigh the anchor and rendered effective by weighing movement of the anchor to swing the flukes thereof outwardly relative to the side of the boat thereby to prevent marring contact of the flukes with the boat.

3. A mechanism to be carried by a boat for weighing anchors of the pivoted fluke type comprising means for weighing the anchor, means rendered effective by weighing movement of the anchor to swing the flukes thereof to prevent harmful contact of the flukes with the boat, and means to assure that when the anchor approaches said fluke swinging means during weighing of the anchor the latter will be disposed in a correct position relative to the fluke swinging means to have the flukes thereof swung by said means.

4. An anchor weighing mechanism for boats comprising means for weighing the anchor, and a normally retracted member projectible by operation of the mechanism to weigh the anchor and effective when projected to hold the anchor from damaging contact with the boat's side during the final portion of the weighing movement of the anchor.

5. An anchor weighing mechanism for boats comprising means for weighing the anchor, a member projectible by operation of the mechanism to weigh the anchor and effective when projected to hold the anchor from damaging contact with the boat's side during the final portion of the weighing movement of the anchor, and means whereby the final portion of the weighing movement of the anchor effects retraction of said member.

6. An anchor weighing mechanism for boats comprising an anchor line guide tube slidably mounted for projection and retraction relative to the boat's side, means to pull the anchor line through said guide tube to weigh the anchor, and means whereby operation of said first named means to pull the anchor line effects projection of said tube to a position in which it prevents damaging contact of the anchor with the boat's side during the final portion of the weighing movement of the anchor.

7. An anchor weighing mechanism for boats comprising an anchor line guide tube slidably mounted for projection and retrac-

tion relative to the boat's side, power means to pull the anchor line through said guide tube to weigh the anchor, means whereby operation of said power means to weigh the anchor effects projection of said tube, and means carried by said tube for engagement with the anchor head to swing the same to prevent harmful contact of the anchor flukes with the side of the boat.

8. An anchor weighing mechanism for boats comprising an anchor line guide tube slidably mounted for projection and retraction relative to the boat's side, power means to pull the anchor line through said guide tube to weigh the anchor, a toggle mechanism operatively connected with said tube and said power means and operable by actuation of the power means to weigh the anchor to effect projection of said tube, means whereby said tube when projected prevents harmful contact of the anchor with the side of the boat during weighing of the anchor, and means whereby the final portion of the weighing movement of the anchor effects retraction of said tube.

9. An anchor weighing mechanism for boats comprising an anchor fluke swinging member mounted for projection and retraction relative to the boat's side, power means for actuating the anchor line to drop and weigh the anchor, means whereby said member is held in a retracted position during dropping of the anchor and until weighing of the anchor is initiated, means whereby operation of said power means to weigh the anchor effects projection of said member and holds the same projected until weighing of the anchor is substantially completed, and means whereby said member when projected is effective during and by the final portion of the weighing movement of the anchor to swing the flukes thereof to avoid any harmful contact of the flukes with the boat's side.

10. An anchor weighing mechanism for boats comprising an anchor chain guide tube mounted for projection and retraction relative to the boat's side, means for paying out and pulling in the anchor chain to drop and weigh the anchor, respectively, an anchor chain guide block slidably and non-rotatably mounted in said guide tube; said block having an opening through which the anchor chain extends and said opening being of a shape to hold the chain against rotation whereby the anchor when weighed is caused always to approach the boat in a certain definite position, said block being adapted to be moved to a position within the outer end portion of said tube when the anchor is dropped, means for latching the block in that position whereby it is disposed to guide the anchor in predetermined relationship to the outer end of the tube when the anchor is weighed, means whereby said tube is held in a retracted position during dropping of the anchor and until weighing of the anchor is initiated, means whereby weighing of the anchor effects projection of said tube and holds the same projected until weighing of the anchor is substantially completed, means whereby the final portion of the weighing movement of the anchor releases the latching means of said block to permit the latter to move inwardly relative to the tube thereby to permit the anchor shank to be accommodated in the outer end portion of the tube, means carried by the outer end of the tube to be engaged by the anchor head during the final portion of the weighing movement of the anchor and by such engagement to effect swinging of the anchor flukes to avoid any harmful contact of the flukes with the boat's side, and means whereby the final portion of the weighing movement of the anchor also effects retraction of said tube.

11. In an anchor weighing mechanism for boats, a tube adapted to project from the boat's side and to have the anchor line extend therethrough, means at the outer end of said tube to be engaged by the anchor head during weighing of the anchor and by such engagement to effect swinging movement of the head to swing the flukes carried thereby to a position in which any harmful contact of the same with the boat's side is prevented, and means carried by the tube to guide the anchor during weighing thereof to a position to assure operative engagement of the head thereof with the head swinging means at the outer end of the tube.

In testimony whereof he hereunto affixes his signature.

WILLIAM A. HAUSENFLUCK.