

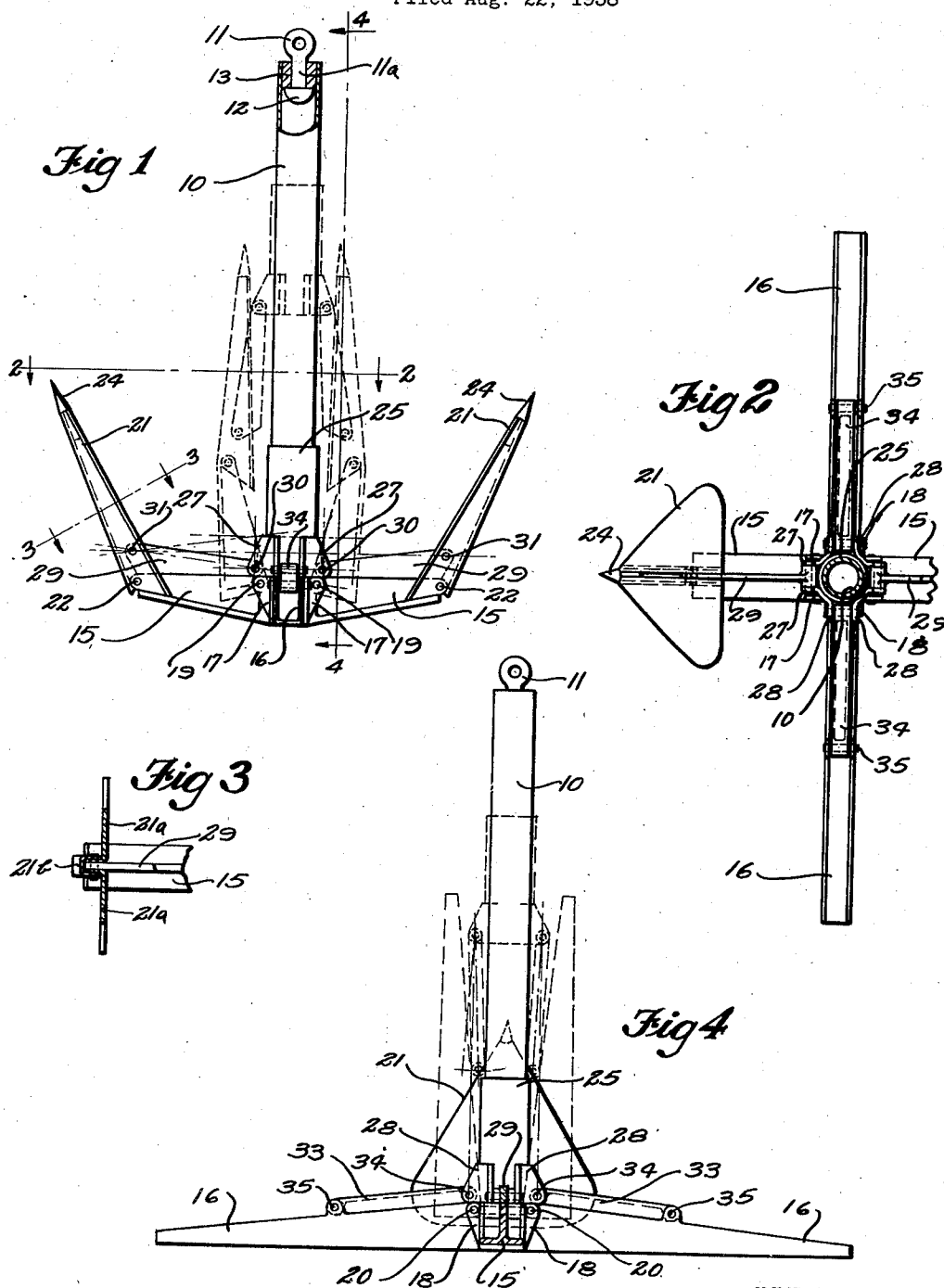
Aug. 29, 1939.

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2,170,889

ANCHOR

Filed Aug. 22, 1938



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2,170,889

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Application August 22, 1938, Serial No. 226,034

7 Claims. (Cl. 114—208)

This invention relates to improvements in anchors, and has reference more particularly to anchors designed for the mooring or anchoring of water craft; it being the principal object of this invention to provide an anchor that is especially adapted for use by sea planes, light sea craft, and craft wherein weight of equipment to be carried and space occupied thereby is of material consequence.

It is also an object to provide an anchor having exceptionally good holding efficiency that is obtained by reason of design and relationship of its parts rather than by reason of the weight of the anchor.

It is a further object of this invention to provide an anchor having fluke arms and cross arms hingedly mounted on a shank against which they are adapted to be folded for compactness when the anchor is not in use.

Still another object of the invention resides in the provision of means whereby the fluke arms, flukes and cross arms of the anchor may be simultaneously moved between extended and collapsed positions and automatically secured against collapse when extended.

More specifically stated, the present invention resides in the provision of an anchor wherein a pair of fluke mounting arms, and a pair of cross arms are pivotally fixed to the shank end, and flukes are pivotally fixed to the fluke arms; and wherein a sleeve or collar is movable along the shank and has links connecting it with the cross arms and fluke arms for moving them between collapsed and extended positions together.

Furthermore, it is an object of the invention to provide a toggling action in the linkage that connects the sleeve and flukes through which a rigid, locking action may be obtained to hold the flukes and fluke arms in extended position and against collapse. Also, to provide a toggle action which will hold the parts in collapsed position.

Other objects of the invention reside in the specific details of construction of the various parts, particularly in those features employed to give strength and rigidity to the anchor.

Still further objects of the invention reside in the combination and relationship of parts and in their mode of operation, as will hereinafter be fully described.

In accomplishing these, and other objects of the invention, I have provided the improved details of constructed, the preferred forms of which are illustrated in the accompanying drawing, wherein—

Fig. 1 is a side elevation of the present anchor, particularly illustrating the fluke, and fluke arm construction; the anchor being shown in open position.

Fig. 2 is a horizontal, cross section as seen on the line 2—2 in Fig. 1.

Fig. 3 is a cross sectional detail of a fluke, as seen on the line 3—3 in Fig. 1.

Fig. 4 is a vertical, cross section on the line 4—4 in Fig. 1, illustrating the cross arm arrangement and linkage connecting the cross arms and sleeve.

Referring more in detail to the drawing—

In its present, preferred form of construction, the shank portion of the anchor, designated by reference character 10, if of tubular form for reduction of weight and maximum strength, and it is provided at its inner end, that being the upper end as shown in Fig. 1, with a swivel ring 11 adapted for either rope or chain connection. This swivel ring has a shank 11a extended through a central opening in a block 13 that is fixed in the end of the shank 10 and this shank is formed with a head 12 at its inner end to hold the swivel against displacement, yet permitting rotation relative to the shank.

At its outer end, that being the lower end as shown in Fig. 1, the shank 10 mounts a pair of fluke arms 15—15 at opposite sides thereof, and a pair of cross arms 16—16 that are located intermediate the fluke arms; the arms of the two sets being adapted to assume the right angular relationship in which they are shown in Fig. 2 when in open or extended position. All of these arms have their inner ends hingedly attached to the outer end of the shank 10 in such manner as to permit them to be folded against the shank, as is indicated in dotted lines in Figs. 1 and 4, and to be extended to their open positions as shown in full lines.

The means employed for hingedly mounting the arms 15—15 and 16—16 on the shank comprises, for each fluke arm, a pair of spaced flanges or ears 17—17 that are fixed to the end of the shank 10. The inner ends of the fluke arms are disposed between paired ears and are secured by hinge pins 19. For each cross arm, there is a similar pair of spaced ears 18—18 that are fixed to the end of the shank 10 and mounting the inner ends of the fluke arms therebetween on hinge pins 20.

As will be observed by reference to Figs. 1 and 4, both the fluke arms and the cross arms have flat end surfaces and are hinged, or pivoted between their mounting ears at points near the

upper edges so that when swung to extended positions, as shown in full lines in Figs. 1 and 4, they will be held against farther travel when substantially at right angles to the shank 10 by reason of their end surfaces coming into flat abutment with the shank 10.

A feature of the present construction resides in the fact that the cross arms are substantially longer than the fluke arms and that when extended, their under surfaces lie in the same straight line, and their top surfaces are inclined downwardly from their inner ends toward their outer ends as will be understood by reference to Fig. 4, whereas the fluke arms, when extended, have their top surfaces substantially in the same line perpendicular to the shank 10, and their under surfaces are inclined upwardly from their inner ends toward the outer ends. This has a bearing on the locking action, as presently will be understood.

A sleeve or collar 25 is fitted about the shank 10 and is slidable therealong, and at its lower end, has actuating connection with the flukes and cross arms; there being connecting links 29 extended between the lower end of the sleeve and the flukes. These links are connected pivotally at their inner ends by pins 30 between paired mounting ears 29 on the lower end of the sleeve and are pivotally connected at their outer ends by pins 31 to the flukes at points spaced somewhat above the pivotal mounting of the flukes on the fluke arms 15. Likewise, links 33 have their inner ends pivotally mounted between ears 28 on the lower end of the sleeve by pins 34, and their outer ends pivotally fixed to the cross arms by means of pins 35.

By reference to Fig. 3, it will be seen that each of the flukes 21 is constructed of two triangularly shaped ears 21a which form the opposite side sections of the fluke and these are joined together along their inner or adjacent edges through the mediacy of a channel bar 21b; the manner of connection being to form the sections 21a along their joining edges with laterally turned flanges and to seat these in the channel bar and weld them thereto, as seen in Fig. 3.

The channel bar faces inwardly and serves to receive the fluke link 29 therein when the parts are adjusted to collapsed position; this being understood by reference to the dotted line position of parts as seen in Fig. 1. The flukes are of triangular form and terminate at their outer ends in a point formed by the securing of a solid conical pin 24 within the outer end portion of the channel bar.

It is to be noted, by reference to Fig. 1, that the upper edge surfaces of the fluke arms 15—15 are substantially perpendicular to shank 10, and that the lower surfaces of the fluke links 29 are adapted to lie flatly in abutment therewith when the fluke arms and flukes are extended. Furthermore, the pivot pins 30 in the ears 27 are at points below the line between the pivot pins 31 connecting the fluke links 29 in the flukes 21. The arrangement and connection of the links 29 results in a toggle connection being formed between the collar 25 and the flukes 21, which retains the anchor locked in an open position against forces that might otherwise tend to fold it up. The locking action of the toggle may be broken or relieved by manually sliding the collar 25 along the shank 10 toward its upper end or until the center of the pins 30 are even with or past the line of the pins 31. As seen in dotted outline in Fig. 1, the flukes and fluke arms

fold up along the shank to a very compact position for storage of the anchor.

Likewise, with the collar in its outer position, the cross arm links 33 prevent the cross arms 16 from folding upwardly, and hold them rigidly in an extended position substantially as shown in Fig. 4. However, when the anchor is folded up, these cross arm links 33 play a very important part in holding the parts in folded position, for when the collar 25 is moved upwardly to the position shown in dotted line, the fluke arm, the fluke and the fluke link limit its travel, and the pivot points 35 swing within the lines between the pivots 34 and 20, thus becoming locked in a folded position. This arrangement tends to hold the anchor locked in a folded position until the cross arms are manually pulled outwardly to break or overcome this toggle action.

Assuming the anchor to be so constructed, its use and mode of operation would be as follows: Considering the anchor to be in a folded position, the user supports the shank 10 in upright position with one hand and pulls the cross arms outwardly thereby to break the toggle action or position of the cross arm links. Then the cross arms and the fluke arms fall to their open position by reason of their own weight and by a slight pressure the fluke links are toggled into locking position, thus holding the anchor locked in an open position.

Should the anchor come to rest against a surface in a perpendicular position when in use, the tapering lower edges of the fluke arms tend to direct its fall when a slight pull is exerted on the rope or chain from the boat, so as to direct the fluke point downwardly toward the surface, and by the increased length of cross arms beyond the fluke arm to increase its efficiency in taking hold of the ground.

When it is desirable to fold the anchor up for stowing it away while not in actual use, a slight upward pull on the sliding collar breaks the toggle connections in the fluke links and the cross arms may be folded up. A slight inward pressure on the cross arms closes the toggle in the cross arm links and the anchor is ready to be stowed away until the next time it is needed.

By reason of its light weight and compactness of size, such an anchor is readily adapted to be used on seaplanes, clipper ships and small seacraft, as is quite apparent.

This anchor was primarily designed to anchor a craft by biting or digging its flukes into the sea bed instead of by its actual weight, and in tests carried on side by side with other anchors of much larger size and much greater weight, this anchor proved to be many times more efficient.

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

1. An anchor comprising a shank, a fluke arm hingedly fixed to the outer end of the shank for movement from a position lying adjacent the shank to a definitely limited extended position, a fluke hinged on the outer end of the fluke arm and adapted to lie along the shank when the shank arm is so disposed and to be moved to functional position when the arm is moved to extended position, a collar slidable along the shank, a stop on the shank for limiting the movement of the collar outwardly therealong, a toggle link pivotally connected at its ends, respectively, to the collar and to the fluke and adapted, when

the collar is moved to position against said stop to operate as a toggle lock whereby to retain the fluke in its functional position and the arm extended.

5 2. An anchor comprising a shank, a fluke arm hingedly fixed to the outer end of the shank for movement from a position lying adjacent the shank to a definitely limited extended position, a fluke hinged on the outer end of the fluke arm and adapted to lie along the shank when the shank arm is so disposed and to be moved to functional position when the arm is moved to extended position, a collar slidable along the shank, a stop on the shank for limiting the movement of the collar outwardly therealong, a toggle link pivotally fixed at its inner end to the collar and pivotally fixed at its outer end to the fluke at a point beyond the hinge connection of the latter with the fluke arm; said link, when the said collar is moved to a position against its stop, operating as a toggle lock whereby to hold the fluke in functional position and engaging the fluke arm to resist any movement from extended position.

25 3. An anchor as recited in claim 2 wherein the points of hinging and pivoting of the fluke arm and toggle link and the location of the stop are all so positioned that, when the fluke arm is extended and the collar is engaged with its limiting stop, the toggle link will lie solidly against the fluke arm in a manner whereby to hold the arm and fluke rigid in the shank and the parts locked against movement toward collapsed position along the shank.

35 4. An anchor comprising a shank, a pair of fluke arms fixed to the shank at its outer end, means mounting the arms hingedly on the shank for movement from positions lying along the shank to extended positions substantially perpendicular to the shank in alinement at opposite sides thereof; said arms having end shoulders adapted to engage in limiting abutment with the mounting means when in extended positions, a fluke hinged on the outer end of each arm and adapted to lie along the shank when its arm is so disposed and to assume an angular functional position relative to the arm when the latter is extended, a collar slidable along the shank and adapted to engage in limiting abutment with the fluke arm mounting means when the fluke arms are extended, and links pivotally connected at their inner ends to the collar and at their outer ends to the flukes at points beyond their hinged connections with the fluke arms and adapted, when the collar is engaged against said fluke arm mounting means to function as a toggle lock whereby to hold the flukes in functional position and the arms against movement toward the shank.

5 5. An anchor comprising a shank, a fluke arm hingedly fixed to the outer end of the shank to move from a collapsed position lying along the shank to a definitely limited extended position, a fluke hinged to the outer end of the fluke arm, a cross arm hingedly fixed to the outer end of the shank to move from a collapsed position lying along the shank to a definitely limited extended position, a collar slidable along the shank, a limiting stop for the collar adjacent the outer end of the shank, links pivotally connected at their inner ends to the collar and at their outer ends to the fluke and cross arm; the link which connects with the fluke operating, when the collar is against its limiting stop, as a toggle lock, whereby to hold the arm and fluke in extended position, and to hold the collar against releasing movement along the shank by reason of any collapsing pressure applied against the fluke arm.

20 6. An anchor as in claim 5 wherein the link which connects the collar and cross arm is of substantially the same length as the distance from the point of hinging of the cross arm to the point of attachment of the cross arm and link whereby to have an inwardly breaking toggle action when the parts are in collapsed position and thereby lock the collar against movement toward the outer end of the shank by reason of weight or pull applied thereto through the link connected with the fluke.

25 7. An anchor comprising a shank, a pair of fluke arms mounted hingedly on the outer end of the shank at opposite sides thereof, a pair of cross arms hingedly mounted on the outer end of the shank at opposite sides thereof and intermediate the fluke arms; said fluke arms and said cross arms being adapted to be moved from collapsed positions lying along the shank to open positions extended substantially perpendicular thereto, and adapted to engage in limiting abutment with their mounting means when in extended positions, a collar slidable along the shank and adapted to engage in limiting abutment with the arm mountings, links connected pivotally to the collar and to the cross arms, flukes hingedly mounted on the fluke arms, links pivotally connected to the collar and to the flukes at points beyond their mountings on the fluke arms, and serving as a toggle lock when the collar is in limiting abutment with the arm mountings, to resist movement of the flukes and fluke arms toward collapsed position, and the first mentioned links serving as toggle locks when the cross arms are in collapsed position to hold the collar against movement by reason of pull thereon for extending the arms.

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