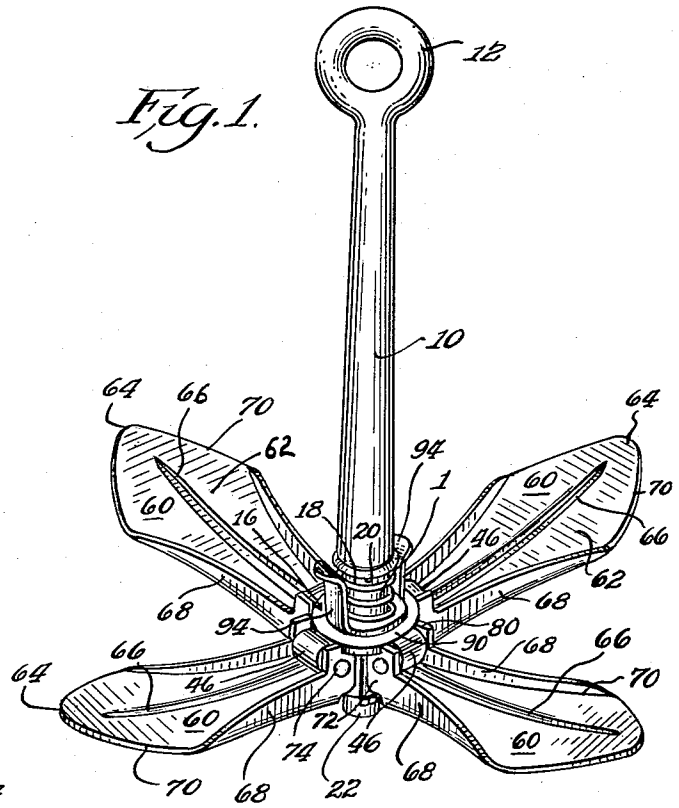
March 3, 1964 R. T. TYTZ 3,123,038

COLLAPSIBLE BOAT ANCHOR

Filed June 25, 1963 2 Sheets-Sheet 1

Fig. 1.



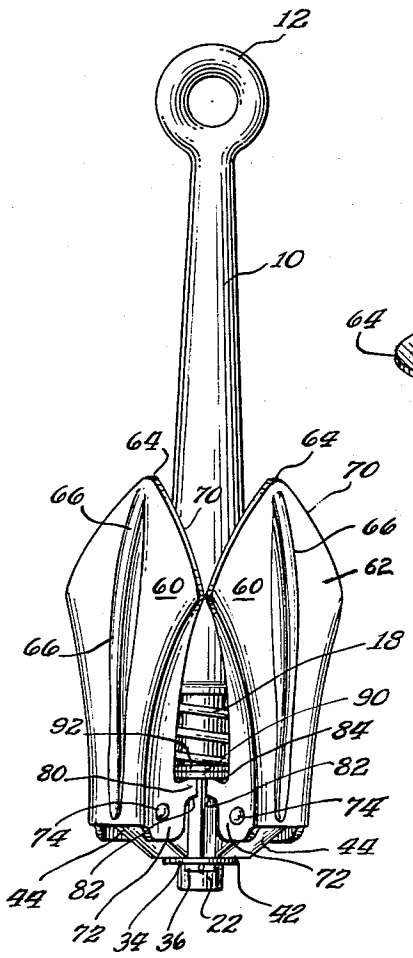


Fig. 2.

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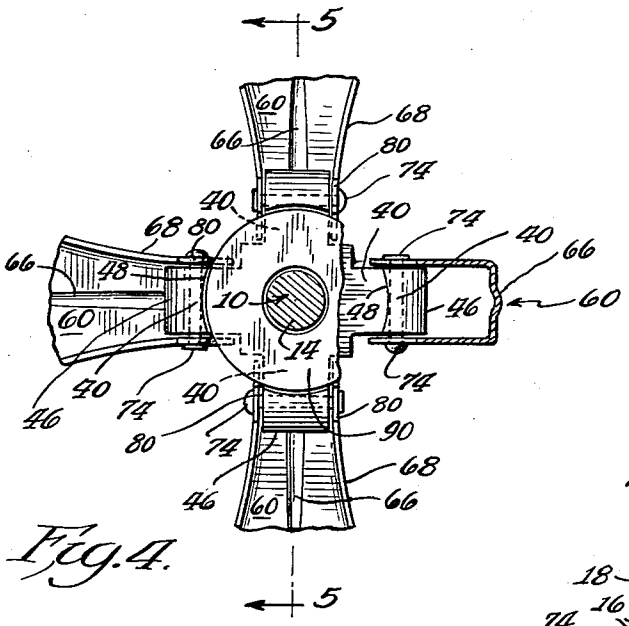


Fig. 4.

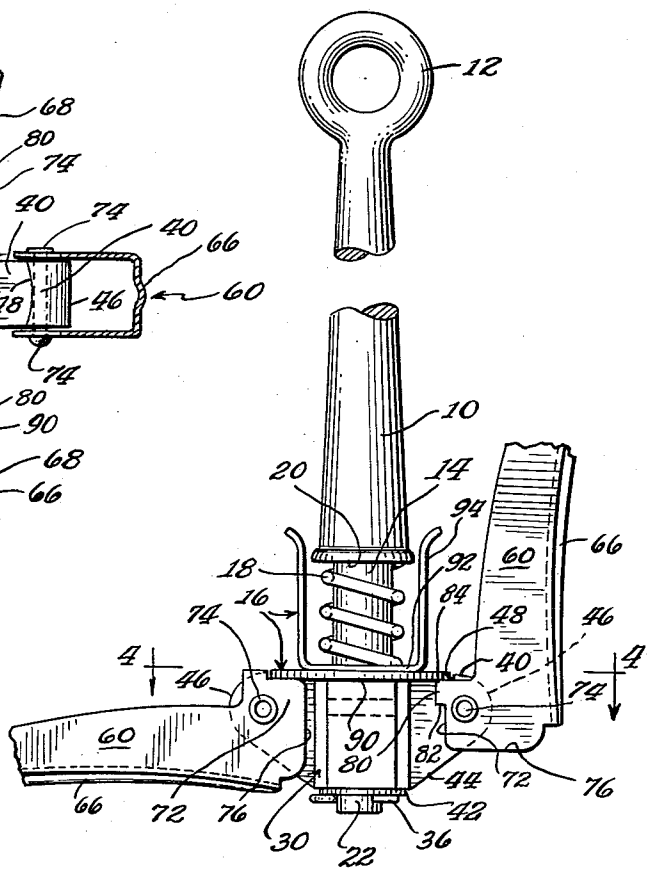
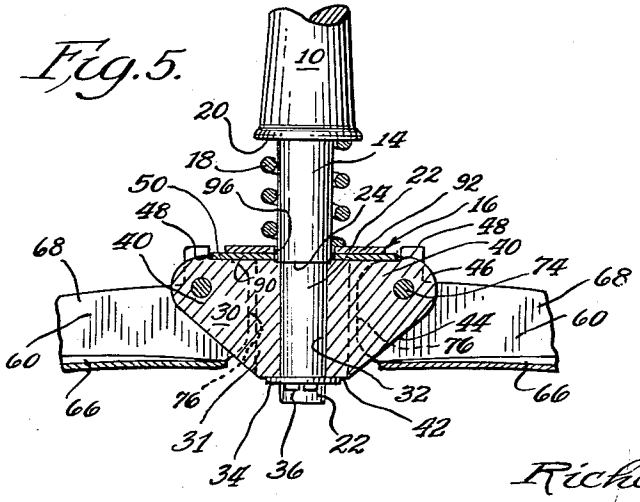


Fig. 3.

Fig. 5.



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COLLAPSIBLE BOAT ANCHOR

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Filed June 25, 1963, Ser. No. 290,481
7 Claims. (Cl. 114—208)

The present invention relates to a collapsible anchor which has been designed for use particularly in connection with small marine craft but also is capable of use in connection with a larger vessel without modification when made in appropriate weight and size.

The principal object of the invention is to provide an anchor having flukes which may, with a minimum amount of effort, be readily folded against the anchor shank to enable the anchor to be stored conveniently, as, for example, in the luggage compartment of an automobile, and to occupy a very small space when so stored.

Another object of the invention is to provide an anchor of the aforementioned character and in which the flukes are pivoted to the lower end of the anchor shank and have associated therewith novel releasable latch means enabling the flukes individually to be retained in their extended or folded positions, the latch means being operable under the control of a single latch element which operates when the flukes are extended to present a solid column of metal between a latch shoulder on each fluke and the shank so as sturdily to hold the flukes against collapse and which, when the flukes are collapsed, exerts only spring pressure against a different shoulder on each fluke so that the flukes may be manually moved to their extended positions without requiring manipulation of the latch means.

A further object of the invention is to provide a collapsible anchor of the type and character under consideration and in which the spring pressure which maintains the flukes in their folded positions is adequate to maintain them folded under any condition of normal use in handling, storing or transportation of the anchor, yet which is sufficiently light that by swinging the anchor preparatory to heaving the same by means of the usual flexible anchor line, the centrifugal force exerted on the anchor flukes serves automatically to cause the flukes to become extended, after which the line may be released to effect heaving or projection of the anchor with the flukes thereof in their extended condition.

A further object of the invention is to provide a collapsible anchor of the general character outlined above and in which all of the principal parts thereof, including the flukes themselves, and with the exception of only the anchor shank, may be in the form of relatively simple sheet metal stampings, thereby contributing toward economy or cheapness of manufacture.

The provision of a collapsible boat anchor which is extremely simple in its construction; one which comprises a minimum number of moving parts and, therefore, is unlikely to get out of order; one which is rugged and durable and, therefore, will withstand rough usage; one which is capable of comparative ease of dismantlement for purposes of parts replacement; one which is attractive in its appearance and pleasing in its design; and one which otherwise is well adapted to perform the services required of it, are further desirable features which have been borne in mind in the production and development of the present invention.

Other objects and advantages of the invention, not at this time enumerated, will become more readily apparent as the following description ensues.

In the accompanying two sheets of drawings forming a part of this specification, one illustrative embodiment of the invention has been shown.

In these drawings:

FIG. 1 is a perspective view showing a collapsible boat anchor constructed in accordance with the principles of the present invention and with the flukes thereof in their operative or extended position;

FIG. 2 is a side elevational view showing the improved boat anchor with the flukes thereof in their inoperative or collapsed position;

FIG. 3 is a fragmentary side elevational view of the boat anchor showing one of the flukes thereof in its extended position and another fluke in its collapsed position, the remaining flukes not being shown in the interests of clarity;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 3 and showing all four removed flukes; and

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4.

Referring now to the drawings in detail, and in particular to FIGS. 1 and 2, the collapsible boat anchor which constitutes the subject of the present invention includes an elongated anchor shank 10 which, in the vertical position thereof shown in FIGS. 1 and 2, has integrally formed at its upper end an eyelet 12 for reception therethrough of one end of a flexible anchor line (not shown). The anchor shank 10 increases in diameter gradually towards the lower end thereof and at its extreme lower extremity is provided a reduced cylindrical integral guide stem 14 which receives thereover a latch collar assembly 16 and a latch spring 18, the nature and function of which will be set forth presently. The juncture region between the guide stem 14 and the shank establishes a first downwardly facing annular shoulder 20. The lower end of the guide stem 14 is provided with a reduced cylindrical integral extension 22 which, in combination with the guide stem, establishes a second downwardly facing shoulder 24 (see FIG. 5).

A four-arm spider 30 having a central hub portion 31 (see FIGS. 3, 4 and 5) with a vertical bore 32 therethrough is rotatably mounted on the guide stem extension 22 and is centered or positioned between the second downwardly facing shoulder 24 and a retaining washer 34, a cotter pin 36 being provided to maintain the parts in position on the guide stem extension 22. The cotter pin 36 underlies the washer 34 and extends through a diametric hole in the lower extremity of the guide stem extension 22.

The spider 34 turns freely on the extension 22 and is formed with a series of four radially extending and equidistantly spaced spider arms 40 (see FIG. 4), each of which presents a small flat bottom face 42 and a frusto-conical side face 44 which extends upwards and outwards from the bottom face 42. The outer or distal regions of the spider arms 40 curve upwardly and inwardly from the upwardly and outwardly inclined frusto-conical side faces 44 as shown at 46 and are provided with vertically extending inwardly facing drop-off shoulders 48. The spider arms 40 embody directly inwards of the lower edges of the shoulders 48 flat horizontal surfaces 50 which are coplanar with the upper face of the spider hub portion 31 and on which the bottom portion of the latch collar assembly 16 seats when such assembly is in a fluke-locking position as shown in FIG. 5.

Pivotally mounted on eacr radially extending spider arm 40 is a sheet metal fluke 60, the details and shape of which are best illustrated in FIGS. 1 and 2. Each of the four flukes is in the form of a generally flat sheet metal stamping of generally pentagonal design and having an elongated, slightly dished, generally flat body portion 62 which tapers to a rounded point 64 at the distal end thereof and is provided with a central longitudinal strengthening rib 66 therealong. The inner regions of the side edges

of the body portions 62 of the flukes 60 are outwardly divergent and have laterally turned reinforcing flanges 68 extending therealong. The outer regions 70 of the side edges of said fluke body portions 62 are convergent and devoid of reinforcing flanges.

The pivotal connection between each fluke 60 and its associated radially extending spider arm 40 is established by means of a pair of attachment ears 72 and a rivet-type pivot pin 74. The pairs of ears 72 are formed as integral parts of the inner or proximal ends of the flanges 68 and are arranged in straddled relation with the end faces of the spider arms 40. The rivet-type pivot pins 74 are positioned horizontally when the anchor shank 10 is in an upstanding position. They project through holes in the ears 72 and bores in the outer regions of the spider arms 40 and have the ends thereof upset in order to form enlarged heads for holding the pins against axial displacement.

Each fluke 60 is movable between an operative or extended position as shown in FIG. 1 and at the left-hand side of FIG. 3, and an inoperative or folded position as shown in FIG. 2 and at the right-hand side of FIG. 3. In their extended position, the flukes 60 project radially outwardly away from the anchor shank 10 and so that they extend at a small angle to a horizontal plane. In their folded position, the flukes 60 extend substantially vertically and closely hug the anchor shank 10, all portions of the flukes lying wholly within the longitudinal confines of the anchor shank so that the over-all length of the anchor as a whole is not increased by the fluke-folding operation.

In the extended position of the flukes 60, the U-shaped inner end edges 76 of the flukes abut against the hub portion 31 of the spider 30 (see FIG. 5), while in their inoperative or folded position, the flukes may, depending on chance, abut against the shank 10 or against one another, but in either even, the distal end regions of the flukes are gathered together in a cluster in close proximity to the shank 10 as shown in FIG. 2.

Means, including the previously mentioned latch collar assembly 16, are provided for releasably holding the flukes 60 in either their extended or their folded position. Accordingly, the attachment ears 72 of each fluke are formed with integral latch projections 80 defining first and second latch shoulders 82 and 84 and extend upwards when the flukes are extended and inwards when the flukes are folded. The shoulders 82 and 84 are designed for latching cooperation with the latch collar assembly 16 in holding the flukes in either their extended or their folded position, as will be described presently.

The latch collar assembly 16 includes a latch collar 90 and a U-shaped actuator 92. The latch collar 90 is in the form of a flat washer, while the actuator 92 is in the form of a plate having up-turned finger grips 94 formed on the end portions thereof. The central or intermediate plate of the actuator 92 rests on the upper surface of the latch collar 90 and is fixedly secured thereto in any suitable manner, as, for example, by spot-welding. A central circular opening 96 is formed in and extends through the latch collar and the central plate of the actuator, and the cylindrical guide stem 14 on the lower end of the anchor shank 10 projects loosely through this opening. The previously mentioned latch spring 18 is in the form of a spiral compression spring. It surrounds the guide stem 14 and has its upper end in abutment with the downwardly facing shoulder 20. The lower end of the spring seats on the central plate of the actuator 92 and yieldingly urges the same and the latch collar 90 downwardly on the guide stem and against the upper face of the spider hub portion 31 as well as against the horizontal surfaces 50 of the spider arms 40, the latch collar 90 seating within the confines of the drop-off shoulders 48 of the spider arms when the collar is in its operative or latched position.

In the operation of the collapsible anchor, assuming the anchor to be in its collapsed condition and attached

to a flexible anchor line, the anchor may be unfolded or extended by the simple expedient of manually engaging the flukes 60 and swinging them, one by one, outward about their respective pivot pins 74. The downward pressure of the spring 18 against the latch collar assembly 16 normally resists the tendency of the flukes to move to their extended position under the influence of gravity inasmuch as the underneath face of the latch collar 90 is disposed directly in the path of movement of the latch shoulders 84. The flukes are thus yieldingly maintained in their folded positions although no solid column of metal or other uniyelding latch means rigidly maintains the flukes folded. Therefore, the application of light manual torque to the flukes will suffice to dislodge them from their folded positions. An experienced operator may cause the flukes automatically to become unfolded against the yielding action of the spiral compression spring 18 by the simple expedient of swinging the anchor shank 10 forcibly by means of the anchor line, the centrifugal force developed during revolution of the anchor about the axis of swinging movement serving to flip the flukes from their folded to their unfolded positions. Upon release of the line, the anchor may be released and thus heaved in its extended operative condition.

Whereas, the flukes of the folded or collapsed anchor are held in their folded condition solely by spring pressure, the extended or unfolded anchor is positively locked in such condition by reason of the fact that a solid column of metal is interposed between each of the latch shoulders 82 and the guide stem 14 at the lower end of the shank 10, this solid column of metal extending radially inward from each shoulder 82 through the latch collar 90 of the latch collar assemby 16 to the guide stem 14. In order to release the various extended flukes 60 for a folding operation, it is only necessary manually to engage the finger grips 94 of the actuator 92 and slide the actuator bodily upwardly along the cylindrical guide stem 14 until such time as the peripheral edge of the latch collar 90 clears the latch shoulders 82, after which the flukes may be moved individually to their folded position, or alternatively, the anchor may be inverted after shifting of the latch collar assembly so that the flukes all together will fall by gravity to their folded positions. Upon release of the actuator 92, the biasing action of the spring 18 will serve yieldingly to retain the flukes folded against the shank 10 and against each other.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. Therefore, only insofar as the invention has been particularly pointed out in the accompanying claims is the same to be limited.

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

1. A boat anchor comprising an elongated shank, means adjacent to the upper end of the shank for attachment to an anchor line, means adjacent to the lower end of said shank defining a pair of oppositely facing opposed axially spaced shoulders, a spider rotatably mounted on said shank and confined between said shoulders against appreciable axial shifting movement in either direction, said spider including a central hub portion from which there project radially outwards a plurality of radial spaced apart spider arms, an anchor fluke pivoted at its proximate end to each spider arm and movable between an extended position wherein it is substantially normal to the axis of the shank and a folded position wherein it lies in close proximity to the shank and in substantial parallelism therewith, a latch projection formed on each fluke and presenting first and second latch shoulders, a latch collar slidable axially on the shank above said oppositely facing shoulders, spring means yieldingly biasing said latch collar downwardly on the shank, said collar overlying and engaging the first latch shoulders on the

flukes when the latter are in their folded position and serving yieldingly to maintain the flukes in said folded position, said collar being in radial alignment with the second latch shoulders on the flukes when the latter are in their extended position and serving to interpose between such shoulders and the anchor shank a solid column of metal in order positively to prevent movement of the flukes away from their extended position, and a manual actuator for facilitating movement of the latch collar against the action of said spring biasing means.

2. A boat anchor as set forth in claim 1 and wherein said latch collar comprises a flat circular washer-like member surrounding the shank, the underneath side of which is yieldingly engageable with the first latch shoulders when the flukes are in their folded positions and the outer peripheral edge of which is disposed in radial register with the second latch shoulders when the flukes are in their extended positions.

3. A boat anchor as set forth in claim 2 and wherein the shank has a downwardly facing shoulder above the level of said oppositely facing shoulders, and the spring means comprises a helical compression spring which surrounds the shank, bears at its upper end against said downwardly facing shoulder, and bears at its lower end against said latch collar.

4. A boat anchor as set forth in claim 1, wherein each of the flukes is in the form of a sheet metal stamping including a generally flat body portion having laterally turned reinforcing flanges extending along its side edges in the proximate regions thereof, said flanges straddling the associated spider arm, and wherein the pivotal connection between each fluke and its associated spider arm comprises a pivot pin projecting loosely through the reinforcing flanges and said associated spider arm.

5. A boat anchor as set forth in claim 4 and wherein the latch projection on each fluke is integrally formed on one of the laterally turned flanges thereof.

6. A boat anchor comprising an elongated solid shank, means adjacent to the upper end of the shank establishing an attachment eyelet for a flexible anchor line, the lower end region of said shank being formed with a reduced guide stem, the lower end of said reduced guide stem

being provided with a further reduced stem extension, the juncture region between the shank and the guide stem establishing a first downwardly facing shoulder, the juncture region between the guide stem and its extension establishing a second downwardly facing shoulder, a spider rotatably mounted on said guide stem extension and presenting a plurality of radial spaced apart spider arms, a cotter pin carried by said stem extension below the spider, and in combination with said second downwardly facing shoulder, serving to maintain the spider on said stem extension against axail shifting, an anchor fluke pivoted at its proximate end to each spider arm and movable between an extended position wherein it is substantially normal to the axis of the shank and a folded position wherein it lies in close proximity to the shank and in substantial parallelism therewith, a latch projection on each fluke and presenting first and second latch shoulders, a latch collar slidable axially on the guide stem, a helical spring surrounding the guide stem, bearing at its upper end against the first downwardly facing shoulder and at its lower end against said latch collar, and serving normally to urge the collar downwardly on the guide stem, said collar overlying and engaging the first latch shoulders on the flukes when the latter are in their folded position and serving yieldingly to maintain the flukes in their said folded position, said collar being in radial alignment with the second latch shoulders on the flukes when the latter are in their extended position and serving to interpose between such shoulders and the guide stem a solid column of metal in order positively to prevent movement of he flukes away from their said extended position, and a manual actuator for facilitating movement of the latch collar against the action of said spring biasing means.

7. A boat anchor as set forth in claim 6 and wherein said latch collar comprises a flat circular washer-like member surrounding the guide stem, the underneath side of the member being yieldingly engageable with the first latch shoulders when the flukes are in their folded positions and the outer peripheral edge of the member being in radial register with the second latch shoulders when the flukes are in their extended positions.

No references cited.