United States Patent [19]

Hungerford

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[45] **Dec. 25, 1973**

[54] **ANCHOR HAVING IMPROVED FLUKE CROWN COUPLING**

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[52] **U.S. Cl.** **114/208**

[51] **Int. Cl.** **B63b 21/44**

[58] **Field of Search** 114/206, 207, 208

[56] **References Cited**

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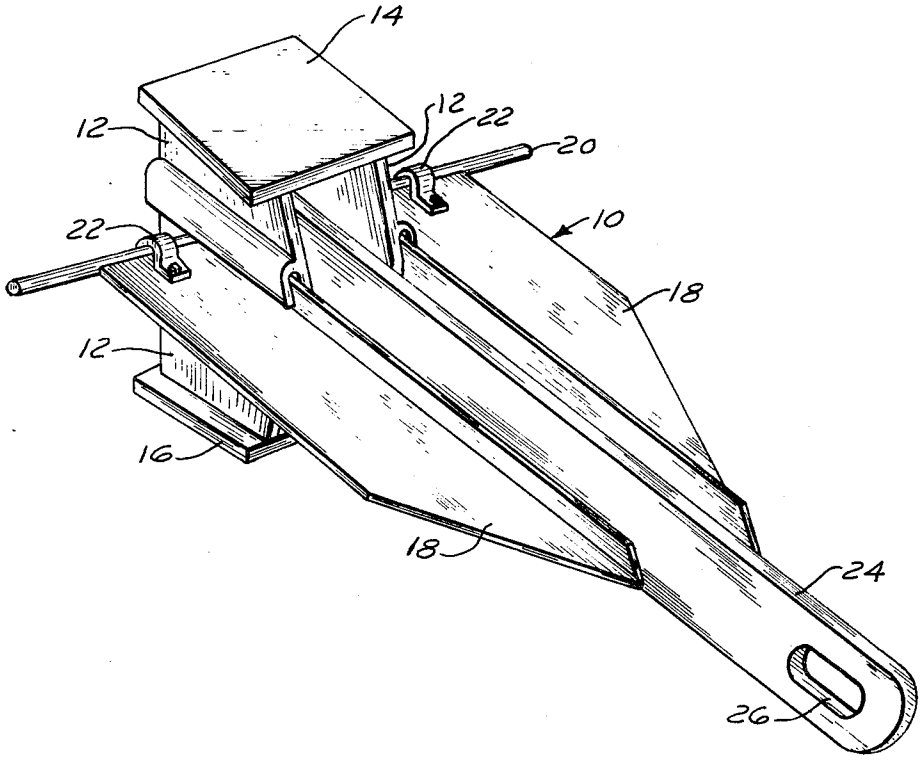
[57] **ABSTRACT**

An anchor for marine vessels having an improved fluke which is removeably coupled to the crown assembly by a longitudinal flange disposed along the fluke inside edge. The removeable flukes allow the shank pivot shaft to be removeably coupled through the crown wall adjacent the fluke flanges.

4 Claims, 6 Drawing Figures



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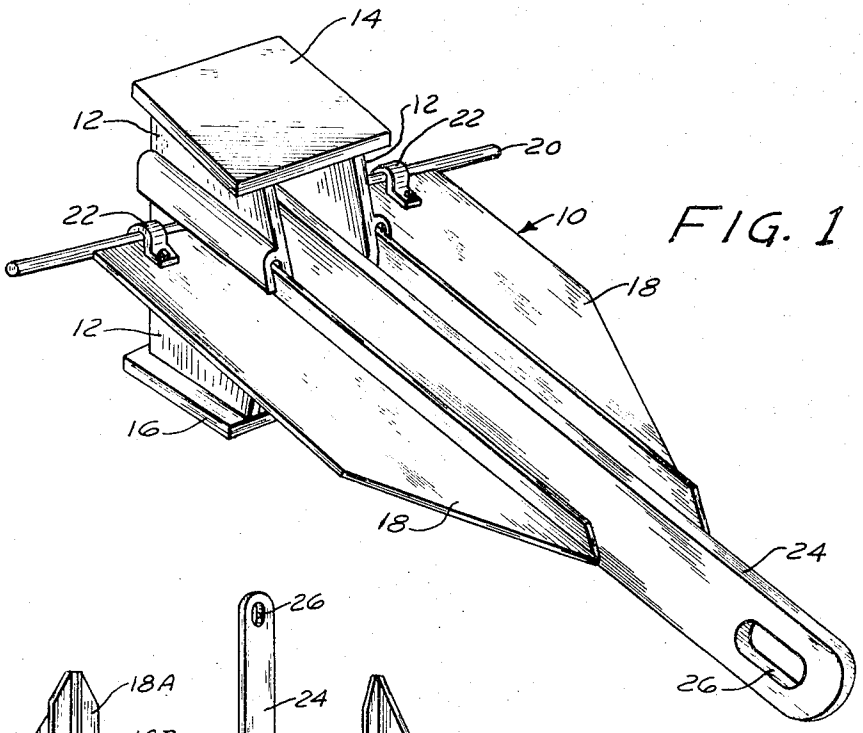
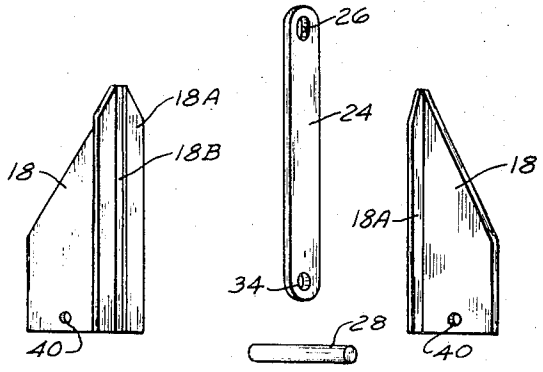


FIG. 1



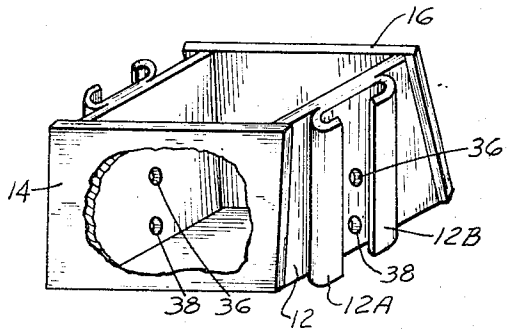
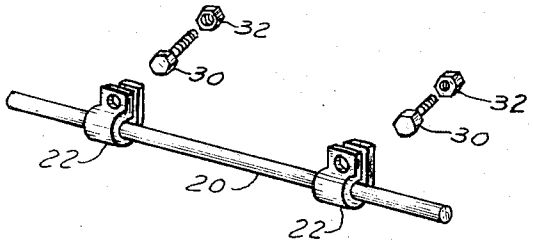


FIG. 2



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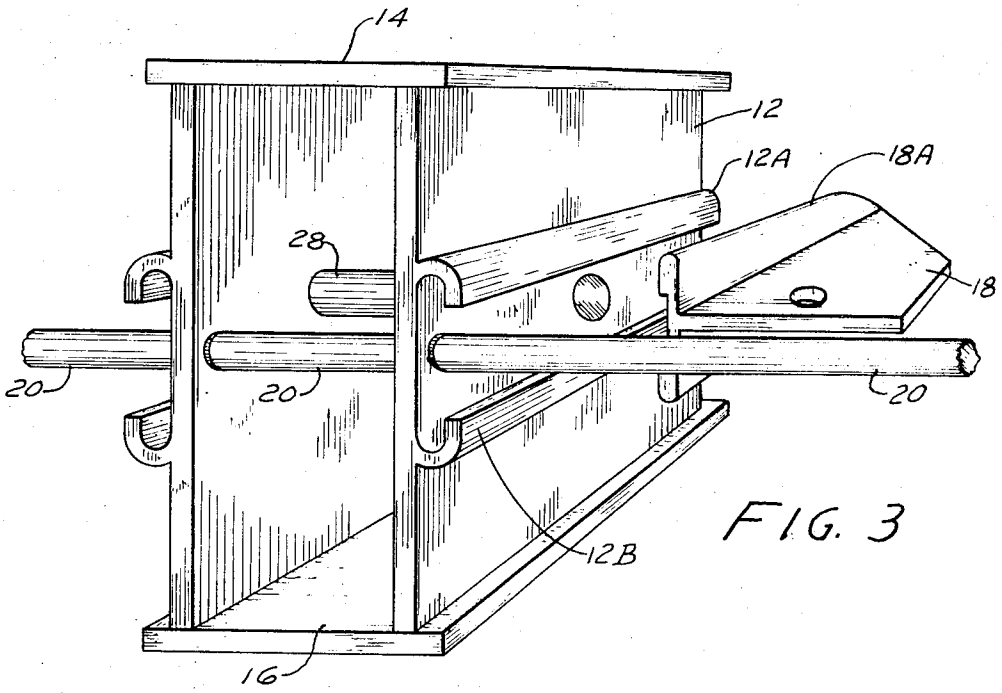

FIG. 3

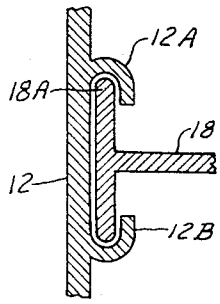

FIG. 4

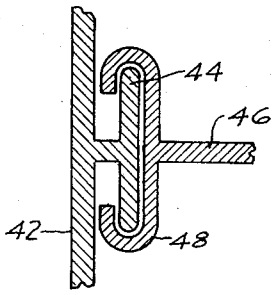

FIG. 5

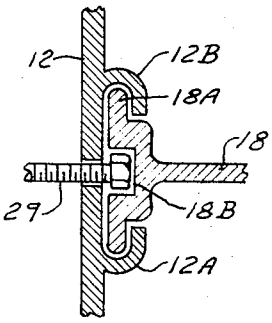

FIG. 6

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ANCHOR HAVING IMPROVED FLUKE CROWN COUPLING

BACKGROUND OF THE INVENTION

This invention relates generally to twin-fluke anchors, and more specifically to an improved fluke and crown assemblage for providing removeable flukes with no reduction in the anchor holding strength.

In the past on twin fluke anchors, the flukes have generally been secured to the crown side walls by welding. Welding is expensive and time consuming and provides a permanent fluke mounting. Structural failures along the weld seams are common. Welding also restricts the use of light-weight materials such as aluminum for anchor construction because of the loss in strength at the welded area without subsequent and costly heat treatment.

Applicant's invention provides a fluke and crown assemblage having increased strength which requires no welding and permits the use of light weight materials in construction and allows disassembling of the anchor elements for storage, shipping, or repair.

BRIEF DESCRIPTION OF THE INVENTION

An anchor for marine vessels having an improved fluke and crown coupling comprising a crown having a pair of flanged receiving side wall portions, a shank, a shank pivot shaft coupled to said crown and said shank, a pair of flukes each having a flanged inside edge interlocked to said crown flange receiving portions and a stock coupled to the bottom edges of said flukes. The flukes are removeable from the crown side walls. The shank pivot shaft may be coupled to the crown through the crown side walls.

It is an object of this invention to provide an anchor having removeably coupled flukes.

It is another object of this invention to provide an anchor constructed from lightweight materials such as aluminum.

It is yet another object of this invention to provide an anchor having no welded portions between the flukes and the crown.

Yet still another object of this invention is to provide an anchor that may be disassembled for shipping, storage, or repairs.

And still yet another object of this invention is to provide an anchor having an improved shank pivot axis position.

In accordance with these and other objects which will be apparent hereinafter, the instant invention will now be described with particular reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of Applicant's invention.

FIG. 2 is an exploded view of Applicant's invention.

FIG. 3 is a close-up perspective view of the crown-fluke coupling of Applicant's invention.

FIG. 4 is a cross-section elevation of the crown-fluke coupling of Applicant's invention.

FIG. 5 is a cross-section elevation of an alternate crown-fluke coupling in accordance with Applicant's invention.

FIG. 6 is a cross-section elevation of another alternate crown-fluke coupling in accordance with Applicant's invention.

PREFERRED EMBODIMENT OF THE INVENTION

Referring now to the drawings and in particular to FIG. 1, Applicant's anchor **10** is comprised of a crown having a pair of supporting members **12** rigidly attached at their ends to angularly disposed crown plates **14** and **16**, a stock **20** disposed through apertures in the crown supporting members **12**, a shank **24** pivotably coupled between the crown supporting members **12** on shank pivot shaft **28** (FIG. 2). Symetrically disposed on each side of shank **24** is a pair of flukes **18**, each fluke having a T-shaped flange along the edge adjacent the shank **24**. On the outer side of each crown supporting member **12** is a C-shaped female flange removeably coupled about a portion of the T-shaped flange of each fluke **18**. The flukes **18** are connected to the stock by C-clamps bolted through the fluke surfaces.

Referring now to FIG. **2**, crown supporting members **12** are shown coupled to crown plates **14** and **16**. The stock **20** is connected through apertures **38** while the shank pivot pin **28** is connected between apertures **36**. With the exception of the crown plates **14** and **16** which are permanently coupled to crown supporting members **12**, the entire anchor may be disassembled as shown in FIG. **2**. This is possible because the crown supporting members have an outside facing C-shaped female flange with projecting arms **12A** and **12B** which are sized to receive the T-shaped flanged edge **18A** of each fluke **18**. The fluke flange **18A** slides down into the crown flange arms **12A** and **12B**, where it fits snugly. The fluke is secured to the stock **20** by C-clamps **22** (FIG. 1).

With removeable flukes **18**, the shank pivot axis **28** (FIG. 3) may be separated from the stock and moved forward closer to the front of the crown support **12**. This reduces the length of the moment arm whenever the shank is rotated into contact with the front edges of crown plate **14** or **16** which define the limits of angular travel of the shank **24**. The shank pivot shaft **28** is positioned in apertures **36** (FIG. 2), the ends of which are adjacent the fluke flange surfaces **18A** when the flukes **18** are coupled to the crown support member **12**.

FIG. 4 shows the male fluke flange **18A** snugly coupled within the female crown flange arms **12A** and **12B** engaged in the working position. However the crown wall **42** in FIG. **5** has the T-shaped male flange **44** engaged to the female C-shaped arms **48** protruding from a fluke **46**, as an alternate embodiment of the flange coupling of FIG. **4**.

FIG. **6** shows a fluke flange **18A** having a groove **18B** disposed along the surface adjacent the crown supporting member surface. The groove **18B** allows the shank pivot shaft to extend through and/or be bolted through the crown housing thus permitting the fluke to slide over the ends of the protruding shaft and/or the bolt head or nut attached to shank shaft **28**.

The anchor may be disassembled for shipping, storage or repair as shown in FIG. **2**. Broken flukes may be replaced individually. When ready for use the shank **24** is attached to the fluke by the pivot shaft **28**. Flukes **18** are positioned in and slid within the crown support flange arms **12A** and **12B**, the fluke ends being stopped adjacent the stock apertures **38**. The stock **20** is inserted into the crown housing apertures **38** and bolted to the flukes. The anchor is then ready for use.

Large forces are experienced along the crown-fluke coupling boundary which have caused welding seams to fail in the past. However the flange boundary will take large amounts of stress and shear without break-

down, thus allowing for the use of lightweight materials such as aluminum which are difficult to weld and when welded are not very strong. The crown housing may be welded or riveted together (supporting members **12** to crown plates **14** and **16** in a trapezoidal shape) or may be cast by means of a sand mold, permanent mold or die into one monolithic structure. The top and base of the crown are open to permit flow through. The angular disposition of the crown plates with respect to the fluke plane is selected to aid fluke penetration into the mooring bottom.

Thus Applicant's anchor, having an improved crown-fluke coupling provides a lightweight, dependable anchor that may be disassembled.

The instant invention has been shown and described herein in what is considered to be the most practical and preferred embodiment. It is recognized, however, that departures may be made therefrom within the scope of the invention and that obvious modifications will occur to a person skilled in the art.

What I claim is:

1. A twin fluke anchor comprising:

a stock;

a crown having a pair of parallel supporting walls coupled together by a pair of crown plates;

receiving means on said crown support walls;

a pair of flukes, one on each side of said crown, the flukes coupled to the stock along the rear edges of each fluke removeably coupled to said support wall receiving means along an inside fluke edge portion, said receiving means being on the outside of said crown support walls, said support wall receiving means being a pair of flanged C-shaped arm members protruding outwardly from the crown supporting walls; and a shank pivotally coupled to said crown.

2. An anchor as in claim **1**, wherein said flukes include:

flanged, T-shaped inner edge portions removeably engageable with said C-shaped support arm members whereby the flukes are removeably coupled to said crown.

3. An anchor as in claim **2**, including:

a shank pivot shaft coupled to said crown forward of said stock, said shank pivotally coupled to said shank shaft at one end.

4. An anchor as in claim **3**, including:

said shank pivot shaft having a bolt head at one end and a nut receiving threaded portion at the other end;

a nut coupled to said shank shaft;

said flukes having grooved portions along said inner crown coupling edges to fit over said nut and bolt head.

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