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FOREIGN PATENTS

103,452 3/1938 Australia 114/208
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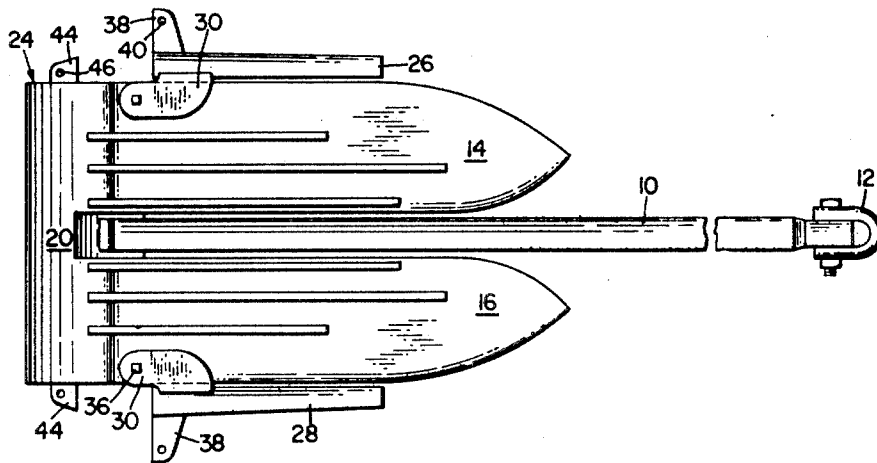
[54] **ANCHOR WITH FOLDING STABILIZERS**
 3 Claims, 4 Drawing Figs.

[52] U.S. Cl..... 114/208
 [51] Int. Cl..... B63b 21/36
 [50] Field of Search..... 114/207,
 208

[56] **References Cited**

UNITED STATES PATENTS
 3,263,642 8/1966 Wilson 114/208

ABSTRACT: In an anchor construction of the type wherein a pair of fluke arms are journaled at the end of a shank the improvement which consists in providing stabilizers hinged to the outside edge of each fluke and constituting an extension of the tripping palm surfaces. Each stabilizer is moveable from a retracted shipping and storage position closely abutting the outer edge of the fluke to an extended operating position in substantial alignment with the fluke trunnion. Means is provided to lock the stabilizer arms in their extended positions.



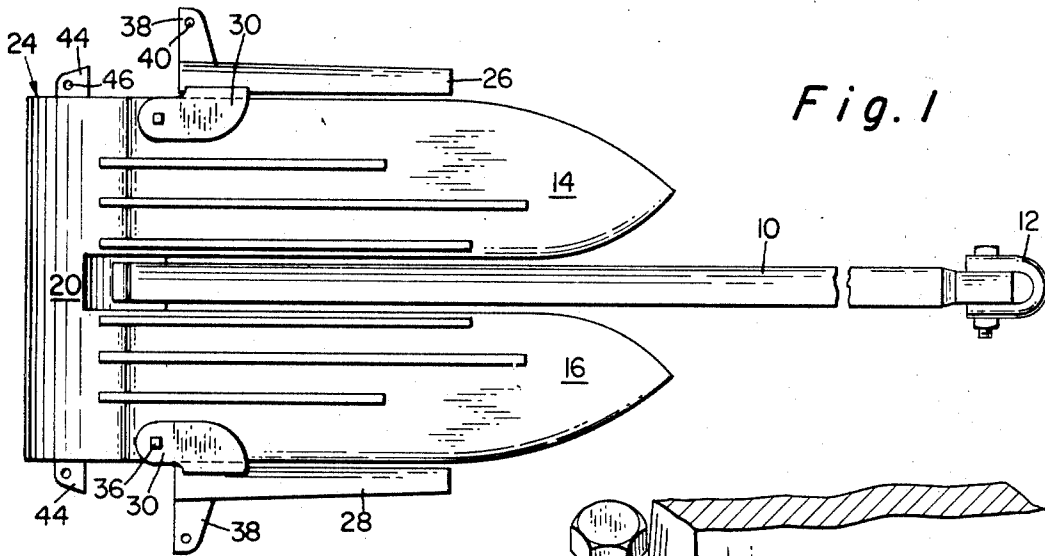


Fig. 1

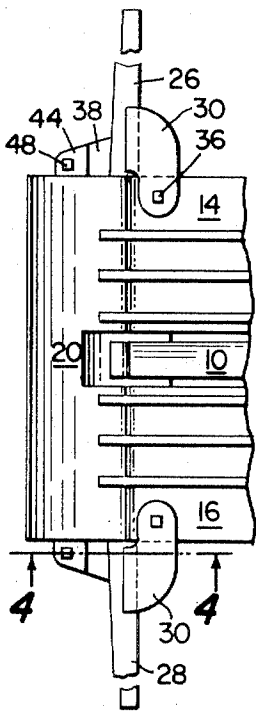


Fig. 2

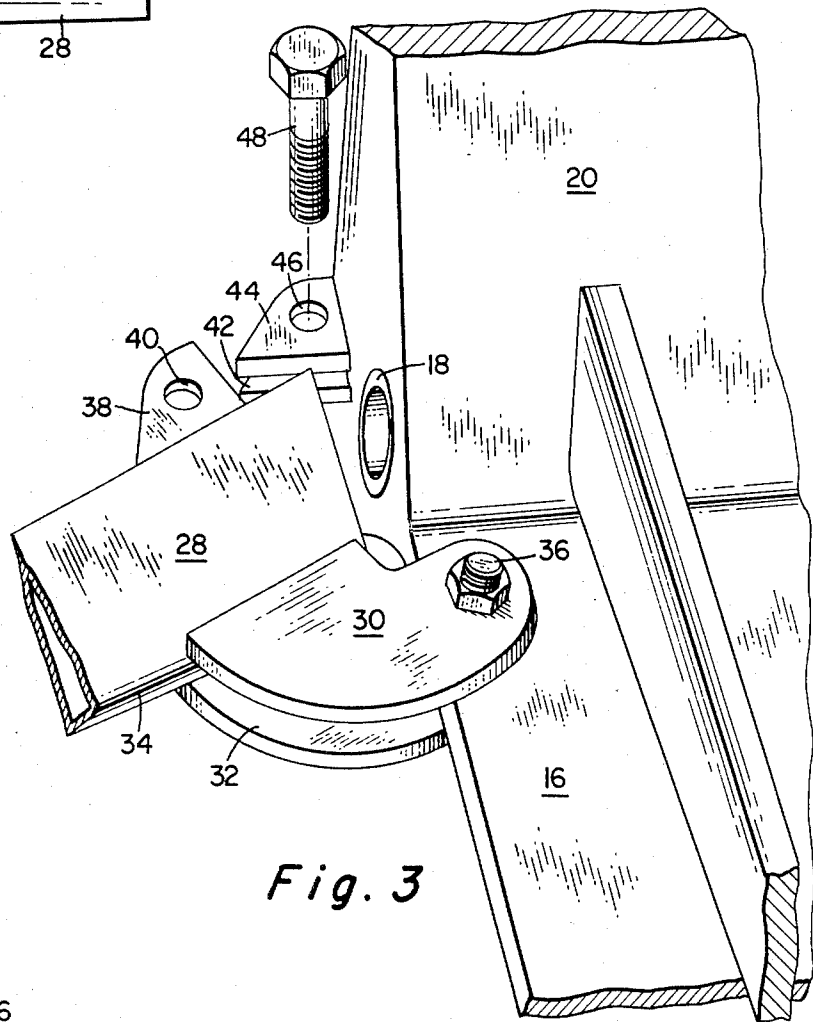


Fig. 3

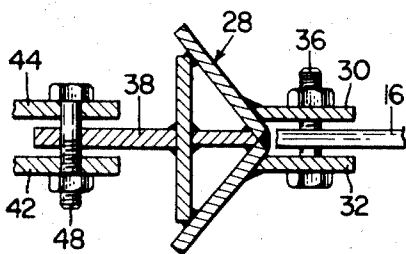


Fig. 4

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ANCHOR WITH FOLDING STABILIZERS

STATEMENT OF GOVERNMENT INTEREST

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.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to ship type anchor constructions for mooring floating structures and particularly to anchors having protruding portions which can be collapsed for shipment and storage.

2. Description of the Prior Art

Heretofore anchor constructions have been devised which were collapsible for storage or shipment and which could be erected on site for use. Such devices generally utilize rather involved linkages and supports to reinforce the anchor parts and, though satisfactory in the smaller sizes, prove cumbersome and impractical as anchor size is increased.

Furthermore it is essential that the collapsible means be simple in nature, strong in construction and capable of satisfactory operation even after prolonged exposure under corrosion inducing conditions.

In larger sizes such anchor constructions ordinarily contemplate that the projecting parts, such as stabilizer arms, will be permanently welded in place either prior to shipment or upon arrival in the field. If the latter, it is of course required that there be available in the field suitable welding equipment and also suitable heavy anchor lifting and positioning equipment.

SUMMARY OF THE INVENTION

An anchor construction wherein a stabilizer arm is hinged mounted on the outer edge of each fluke. During storage or shipping each arm is folded alongside the outer edge of its fluke. When required for use each arm may be swung down into a laterally projecting position so as to constitute an extension of the crown assembly and a continuation of the tripping plate surfaces.

STATEMENT OF THE OBJECTS OF INVENTION

It is an object of the present invention to provide an anchor construction which may be stored and shipped in a folded or collapsed condition but which can be erected on site with a minimum of effort or tools and during which the use of welding equipment is not necessary.

A further object is to provide in such an anchor a construction wherein the stabilizer arms, when extended, constitute extensions of the surfaces of the tripping palm plates and move with such plates.

Another object is to provide an anchor assembly of the character described which does not require the use of heavy lift equipment to ready it for use.

Other objects, advantages, and novel features of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of an anchor incorporating the present invention.

FIG. 2 is a similar view of a portion of FIG. 1 with the stabilizer arms extended.

FIG. 3 is a perspective detail view, greatly enlarged, of the stabilizer arm rugged hinge construction and lock means.

FIG. 4 is an enlarged cross-sectional view through one of the stabilizer arms and associated hinge and lock means, taken along a line substantially corresponding to line 4-4 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing in detail, there is illustrated a conventional anchor construction which includes an elongated centrally disposed shank 10 having an anchor chain engaging shackle 12 located at one end and a pair of twin flukes 14 and 16 pivotally mounted at the other end.

Flukes 14 and 16 lie on opposite sides of shank 10 and may be supported on a journaled trunnion bar 18 which lies within the oppositely directed flat tripping plate surfaces of the crown assembly 24. The details of a suitable journal arrangement are shown in our prior U.S. Pat. No. 3,015,299 and therefore are not repeated here.

The improvement of the present invention lies in the provision of two lateral stabilizer arms 26, 28 mounted in the manner shown. In normal use these arms extend outwardly in diametrically opposed directions constituting an extension of the tripping plate surfaces of the crown assembly. They serve to keep the anchor when dropped from resting on edge and hence assure that the twin flukes lie relatively flat on the ocean bottom so that the maximum purchase is obtained. It will be clear that the stabilizers necessarily project a considerable distance, and also that they must each be very strongly and rigidly affixed to the crown assembly in order to withstand the great strains of use. For this reason they have heretofore been securely welded either during anchor manufacture or, if welding equipment is available they may be attached in the field after the anchor has been shipped in disassembled condition.

There is of course a considerable disadvantage to such arrangement since welding equipment is frequently not available in the field, also heavy lifting equipment adequate to hold the parts in alignment during welding is frequently not available in the field.

In the present invention the lateral stabilizers 26 and 28 each are pivotally supported upon its adjacent fluke by a very sturdy hinge and lock arrangement. As best illustrated in FIG. 3 this includes a pair of spaced cheeks 30, 32 of rugged construction securely mounted to the respective stabilizer arm 28 with the cheeks welded to and projecting from the stabilizer on opposite sides of a ridge point 34. The cheeks 30 and 32 are apertured to receive a hinge pin 36 and by movement about this pin the lateral stabilizer arm 28 may be moved into a position alongside its adjacent fluke 16 as illustrated in FIG. 1.

In order to lock the lateral stabilizers 26 and 28 in their extended position so that the two forward surfaces constitute extensions of the tripping palm surfaces 20 of the crown assembly each lateral stabilizer arm is provided on the rear face with a projecting weldment 38 having a lock bolt receiving aperture 40 near its tip. When the lateral stabilizing arm is swung into the outwardly extending position this weldment 38 is received between two cheeks 42 and 44, each of which is similarly apertured at 46 to receive a lock bolt 48. With the lateral stabilizing arms extended and the lock bolt in place all movement of such arms is prevented and they are securely retained in their extended position.

By accurately positioning the lock bolt holes and by leaving adequate tolerance the lock bolt shank 48 is freed of shearing stress and instead rearward strain on the stabilizer arms is placed squarely at the place where the inner end of each stabilizer arm meets the end of the crown assembly. The absence of severe pressure on the lock bolt keeps it from being deformed and facilitates its ready withdrawal and re-use.

In FIG. 4 the lock bolt is shown in place and the forward edge of the stabilizer is retained in alignment by the edge of the heavily reinforced fluke, hence an exceptionally strong union of the parts is obtained.

Through the use of this invention the width of a large anchor was reduced 60 percent from a width of 12 feet to under six feet. This is a great advantage during shipping and storage. In addition the holding power of the anchor is greatly augmented by the aforementioned extension of the surface of

the tripping palms. It has been found that in an anchor of the character illustrated approximately 22 percent of the total holding power is derived from such extension of the surface of the tripping palms onto the stabilizers.

We claim:

1. A large heavy anchor construction of the type which is normally flat during storage and shipment and wherein an elongate shank is provided at one end with a transversely-extending fluke supporting journal shaft and fluke arms lying in a common plane are positioned on opposite sides of said shank, said anchor including a crown assembly constituting extensions of said flukes, the improvement which comprises:

- a pivot assembly located on each fluke adjacent the outer edge;
- a stock arm supported by each pivot assembly, said stock arms in their folded position each having an edge lying closely along the outer edge of the fluke upon which it is mounted;

said stock arms each having a crown-contacting end abutment located adjacent the pivot assembly which abutment contacts the end of the crown assembly when the

arms are in their extended position to apply the major stock arm deflecting forces thereagainst;

locking means for each arm, said locking means including at least one cheek on the stock arm and one on the crown assembly;

said cheeks overlapping when said arms are in their extended position;

each cheek being formed with an opening, which openings are aligned when said arms are in their extended position;

and a fastening member receivable in said aligned openings;

said pivot, abutment and locking means being so related that the parts are in a predetermined alignment relationship when the stock arms are folded and, upon extension of such arms, are brought into position of maximum arm supporting strength.

2. The anchor of claim 1 wherein the stabilizer arms when extended lie substantially along the axis of the journal.

3. The combination of claim 1 in which the amount of shear stress present on the said lock means is independent of the magnitude of the rearward pressure on the said stabilizer arm.

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