June 6, 1950 R. S. DANFORTH 2,510,867

PROCESS FOR MAKING ANCHORS

Original Filed Sept. 10, 1946

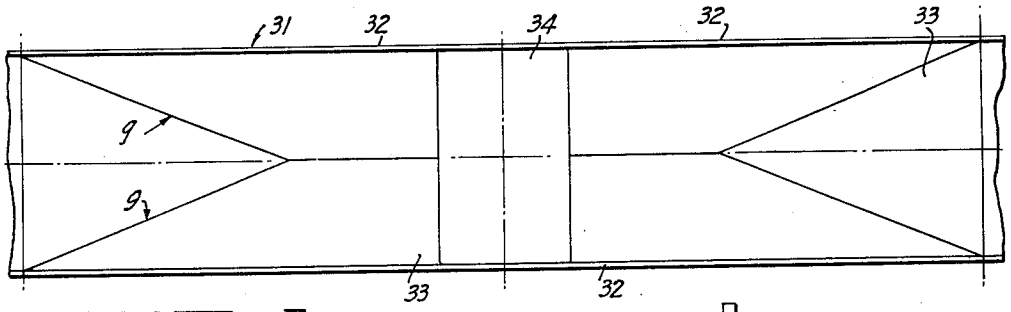
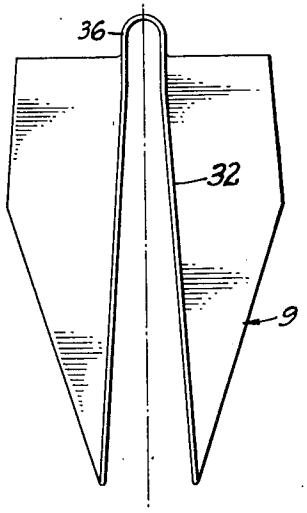


FIG. 1.

FIG. 2.



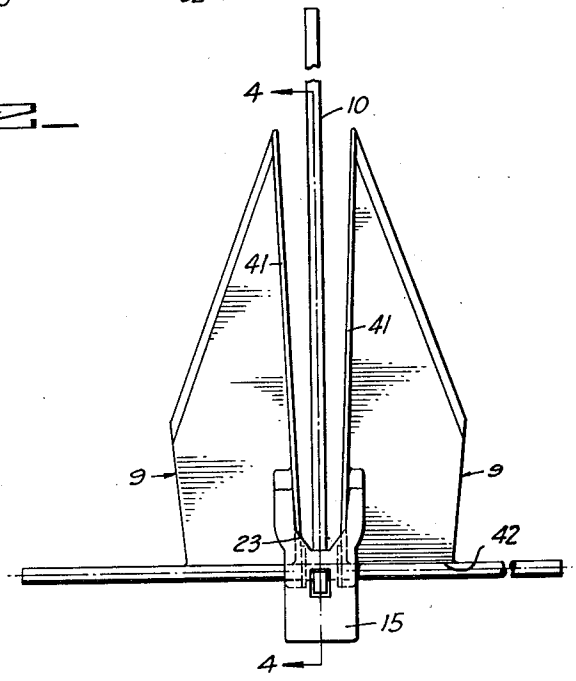


FIG. 3.

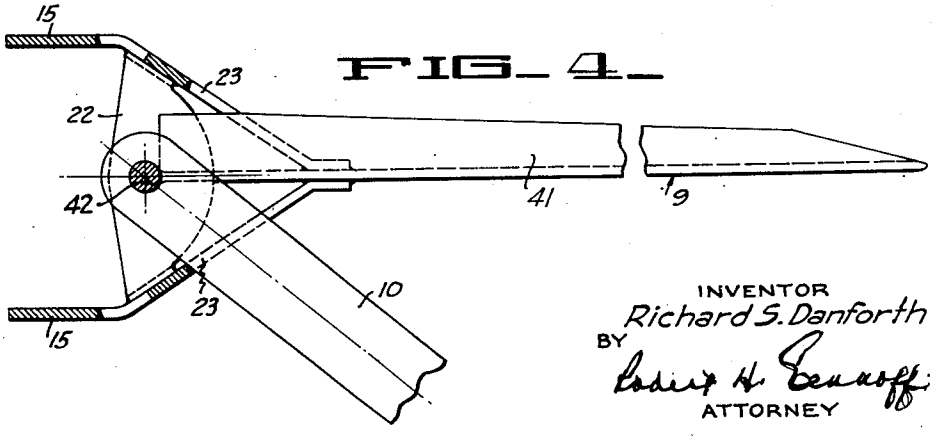


FIG. 4.

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PROCESS FOR MAKING ANCHORS

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Original application September 10, 1946, Serial No. 696,001. Divided and this application May 25, 1948, Serial No. 29,108

2 Claims. (Cl. 29—148)

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This invention relates to an improved method for making an anchor of the type shown in my Patents 2,249,546 of July 15, 1941, and 2,320,966 of June 1, 1943. Such an anchor generally includes a shank with twin flukes generally mounted at one end of the shank and arranged to swing through a limited angle on either side of the shank. A stock is usually provided at either the forward end of the shank or at the after end of the anchor.

As compared to anchors known theretofore, the anchors manufactured in accordance with my aforementioned patents provided vastly increased holding power as well as many operational advantages and improvements. For example, as is reported in Patent 2,249,546, a 29-pound anchor of the construction disclosed in that patent held in excess of 6,000 pounds in hard sand, or better than 200 pounds per pound of anchor weight as compared to 2 pounds per pound of anchor weight for a conventional stockless anchor in the same bottom; in addition, my anchor engaged bottom readily when a pull was applied, the anchor assuming its proper operational position so that continued pull urged the anchor downwardly until the anchor was firmly engaged and remained practically stationary against further pull; the anchor did not rotate under continued pull, that is, it was stable and continued its engagement, as compared to prior anchor structures of the same general type which frequently turned repeatedly about the shank as a central axis until finally the anchor freed itself from engagement with the bottom.

The principal load carrying members of an anchor are the shank and the fluke arm; both these may be likened in stress to the action of a cantilever beam. It has been heretofore established that the holding forces of similar anchors similarly disposed to the surface of a given sea bed are in proportion to the cubes of the characteristic lineal dimensions of the anchors such as the shank length. It should be understood, however, that there are many variable features in anchor design which may affect the penetration of an anchor and thereby affect materially the holding power.

The usual method of constructing anchors of the type with which the present invention is concerned has been to form the several major parts, that is, the stock, shank and flukes, by casting these in suitable molds in accordance with usual foundry practice. This type of construction, while satisfactory, is relatively slow and is comparatively expensive. Another alternative is to form the several parts as by forging, rolling or stamping, subsequently welding or riveting the individual component elements together. While this type of construction is generally more rapid than the usual foundry practice, it is relatively expensive and is not suited to the production of a relatively great number of anchors at low unit cost. I have now found that it is possible to form the anchor of standard metal structural elements or from metal sheets, particularly the fluke portions of the anchor so that a complete anchor can be readily assembled by a few relatively simple welding operations.

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The broad object of this invention is to provide a new and improved process for constructing anchors of the type shown in my aforementioned patents.

In the drawings accompanying and forming a part hereof,

Figure 1 is a diagrammatic view showing one of the methods used in fabrication of the flukes.

Figure 2 is a plan view illustrating one step in the manufacture of the flukes.

Figure 3 is a plan view of a modified form of anchor.

Figure 4 is a view along the line 4—4 in Figure 3.

In accordance with this invention, the twin flukes unit 9 is provided by cutting the unit from an I-beam 31 having flanges 32 joined by a web 33 as appears in Figure 1 wherein I have shown diagrammatically two fluke units 9 laid out on a length of the beam. The beam can be standard structural element having two flanges joined by a web or a T or similar section or one specially rolled to provide a section of the desired shape and material. By utilizing such an element, one is able to fabricate the fluke unit by suitable cutting operation and to form the unit from a metal of suitable strength to provide a structure having a desired strength per unit of weight. Depending on the size of the fluke unit, one can achieve various lay-outs of the fluke unit on the structural element employed, a typical lay-out being that previously referred to and shown in Figure 1. In the larger size anchors, the width of web portion 34 usually does not admit of the lay-out of two fluke units opposite one another as I have shown in Figure 1, and it is necessary to stagger the fluke units with the angular edge of a fluke in one unit falling against an edge of a fluke in another unit. A suitable length of the beam having been cut, the web portion 34 is cut away; the flange is then bent as at 36 until the flukes are in the

same plane and extend in the same direction from the bent portion 36. The flanges 32 are preferably tapered as appears in Figure 2 toward the fluke points and the edges of the flukes are sharpened so the flukes easily penetrate bottom.

In that form of anchor shown in Figures 3 and 4, the stock is provided by a length of rod or tubing and the flukes are fashioned by cutting from a plate and forming a rib 41 on each of the flukes in a brake or other sheet metal working device. The rib is formed on only one side of each fluke (Figure 3) so that a fluke can be used for only a right hand or a left hand fluke, as the case may be. Because of this, the two ribs in each anchor extend in the same directions but on only one side of the flukes. With this construction, equal resistance to burial is provided by each fluke in either operational position. This type of fluke is especially suitable for use in relatively light weight anchors, since relatively light sheet metal plates can be utilized to form the several parts which can be joined by spot welding. The crown construction utilized is such that the swing of the shank 10 relative to the flukes is limited by the aperture 23 formed in each plate 15, said plates 15 being held in spaced relation but by spacers 22.

The anchor disclosed is characterized by a relatively high strength and simplicity in the manufacturing operations, a few simple welds sufficing to join the several parts together. For example, the stock is inserted in place and welds are then made between the rear edges of the flukes and the stock as at 42 to secure the stock in place. With the stock supported in the crown and joined to the fluke edges, each projecting unsupported end of the stock becomes a short cantilever beam of relatively great strength. This enables a lighter stock to be utilized.

This application is a division of my application Serial Number 696,001, filed September 10, 1946, entitled Anchor.

I claim:

1. A method of making a twin fluke unit of an anchor from an I-beam structural member, the I-beam having a length corresponding substantially to twice the overall length of the fluke unit, the method consisting in the steps of cutting away an inner, central portion of the web of the I-beam to form ends of two pairs of flukes, cutting V-notches from outer portions of the web to provide tapers for the flukes, the notches having their apices on the medial line of the web and diverging

substantially to the ends of the flanges, cutting the web down a median line to sever the pairs of flukes one from the other, and then bending each flange about its middle and into a position wherein the flange is substantially of a U-shape with opposite legs of such U substantially parallel and adjacent to one another, and wherein the flukes extend outwardly from said U-shaped flange.

2. A method of making a twin fluke unit of an anchor from an I-beam structural member, the I-beam having a length corresponding substantially to twice the overall length of the fluke unit, the unit being adapted to be mounted upon a shank and stock, the method consisting in the steps of cutting away an inner, central portion of the web of the I-beam to form ends of two pairs of flukes, cutting V-notches from outer portions of the web to provide tapers for the flukes, the notches having their apices on the medial line of the web and diverging substantially to the ends of the flanges, cutting the web down a median line to sever the pairs of flukes one from the other, and then bending each flange about its middle and into a position wherein the flange is substantially of a U-shape with opposite legs of such U at an included angle to one another of approximately 8° and spaced apart a distance equal to between 3% and 6% of the length of the said shank, and wherein the flukes extend outwardly from said U-shaped flange.

RICHARD S. DANFORTH.

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