Oct. 20, 1970 F. J. LUKETA 3,534,461

TRAWL WINCH MOUNTING METHOD

Original Filed Dec. 31, 1962 3 Sheets-Sheet 1

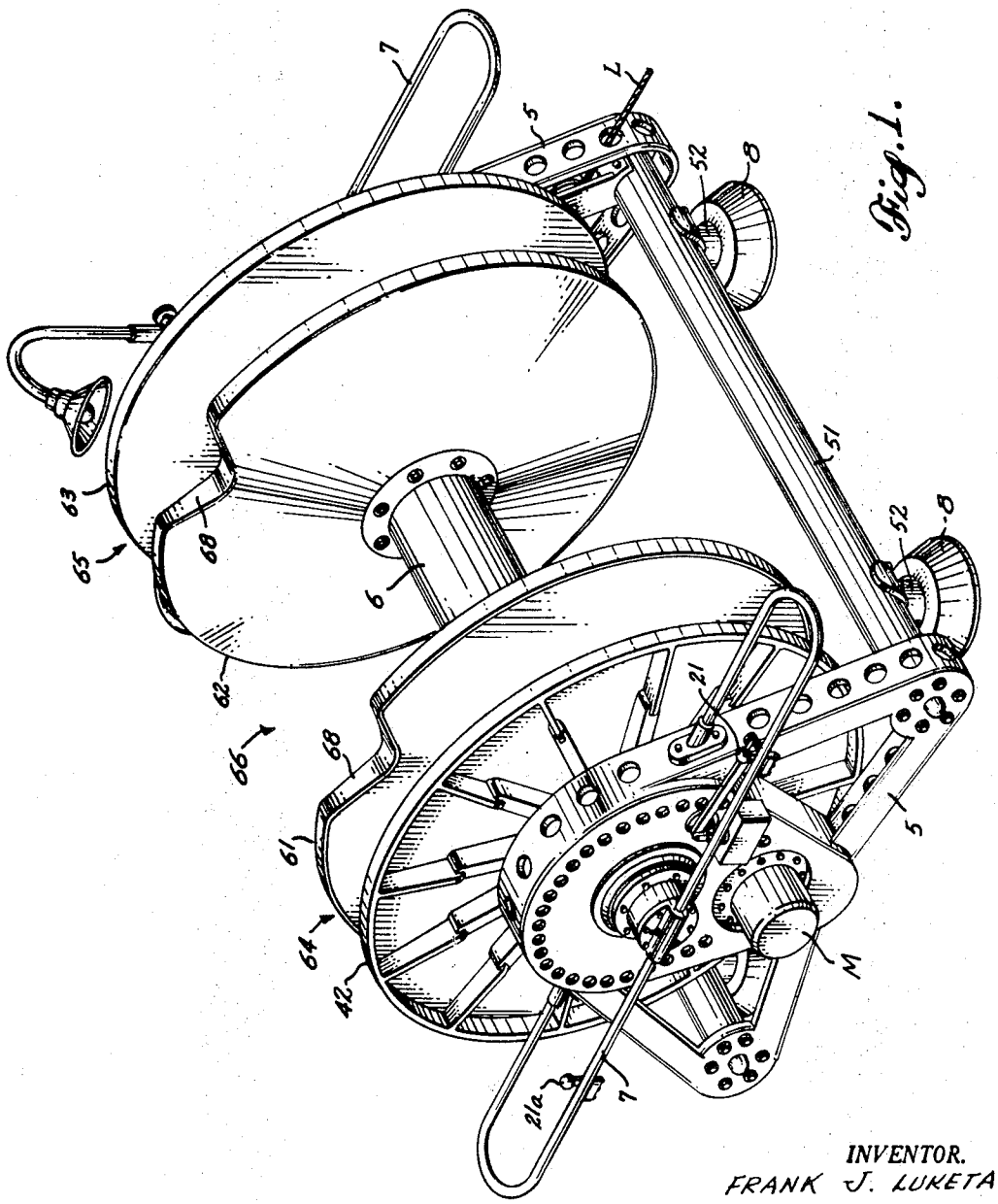


Fig. 1.

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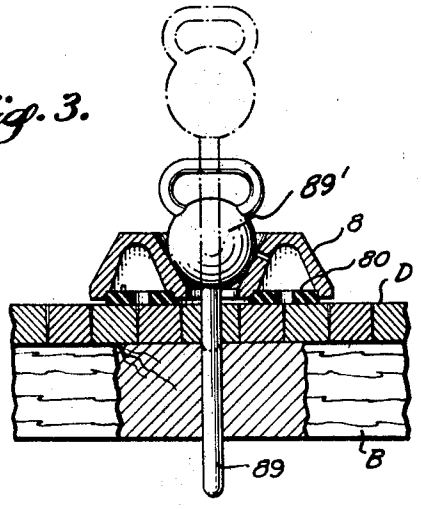
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Fig. 3.



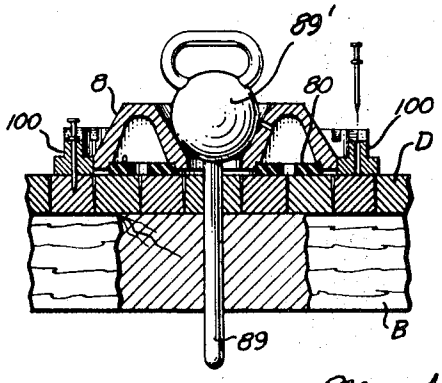


Fig. 4.

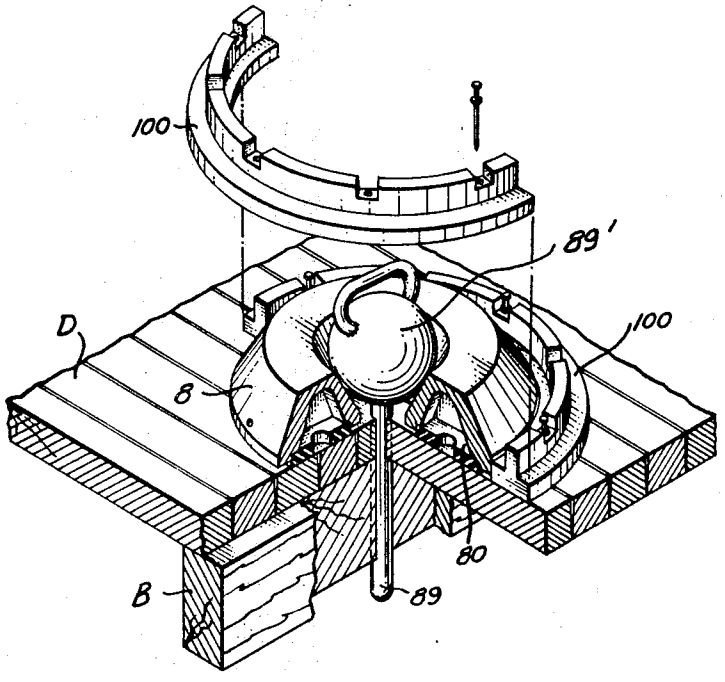


Fig. 5.

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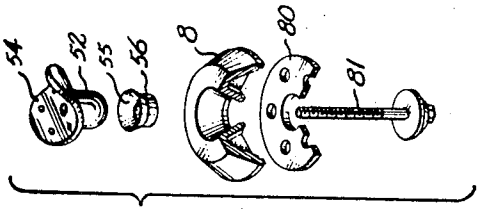


Fig. 6.

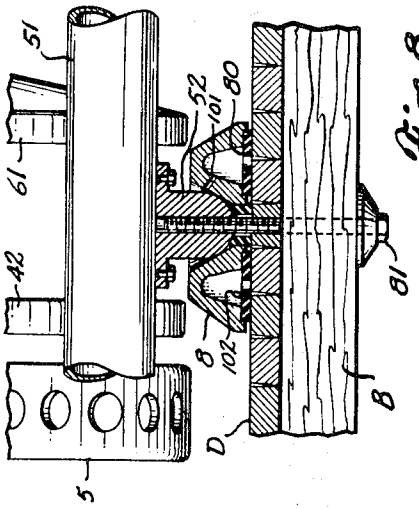


Fig. 8.

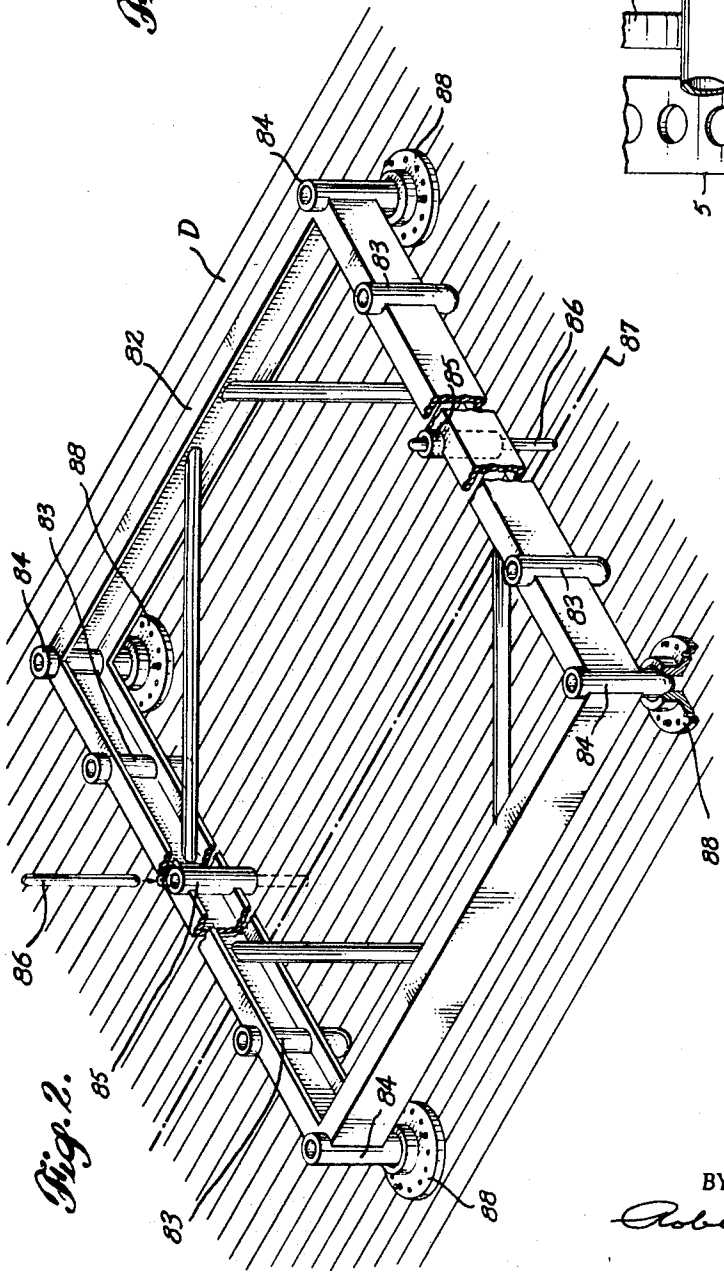


Fig. 2.

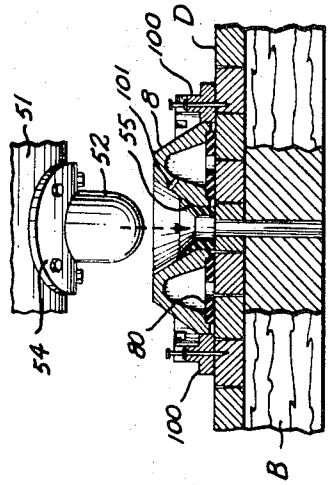


Fig. 7.

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United States Patent Office

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TRAWL WINCH MOUNTING METHOD

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Application Jan. 25, 1967, Ser. No. 611,777, which is a continuation of application Ser. No. 471,955, July 14, 1965, which is a division of application Ser. No. 248,452, Dec. 31, 1962, which in turn is a continuation-in-part of application Ser. No. 836,636, Aug. 28, 1959. Divided and this application Feb. 20, 1968, Ser. No. 706,954

Int. Cl. B23q 3/00

U.S. Cl. 29—464

1 Claim

ABSTRACT OF THE DISCLOSURE

Anchoring bolt holes for the winch are located for drilling in the ship's deck by a jig. Deck pads having upwardly flaring sockets are located relative to the drilled holes by locators having stems projected into the holes and balls seating in the deck pad sockets. The winch feet having hemispherical lower ends are then placed in the deck pad sockets and hold-down bolts are inserted up through the deck holes and screwed into tapped bores in the winch feet.

This application is a division of my patent application Ser. No. 611,777, filed Jan. 25, 1967, now abandoned, for Trawl Winch Mounting Deck Pad Locator, which is a continuation of my patent application Ser. No. 471,955, filed July 14, 1965, for Trawl Winch Mounting Deck Pad Locator, now abandoned, which is a division of my patent application Ser. No. 248,452, filed Dec. 31, 1962 for Trawl Winch Mounting, now Pat. No. 3,235,206, which is a continuation-in-part of my patent application Ser. No. 836,636 for Winch for Hauling Trawl Nets, filed Aug. 28, 1959, now abandoned. The winch of that patent application was devised particularly to haul and receive a special type of trawl. The winch mounting deck pad locator of the present invention is particularly suitable for mounting various types of trawl winch on ship decks, but it is also useful for mounting winches of other types on a sloping deck, or other uneven or inclined surface.

The mounting of a winch upon the crowned or sloping deck of a vessel is ordinarily a difficult and time-consuming operation. Such a winch will exert and be subjected to a heavy pull, which at times may be in a direction other than perpendicular to the rotative axis of the winch drum, so that the force of such pull will tend to wrack the winch and its frame, and perhaps to exert unequal loads on the various anchors of the winch. It is necessary to secure such a winch to the ship's deck very securely without creating leaks in the deck and it is desirable for the winch thus to be mounted without requiring attention, or adjustment, throughout the useful life of the winch. The problem is particularly difficult when it is desired to set and maintain the alignment of the drum bearings accurately, although the winch is mounted on a sloping deck, and even though it may be desired to secure the winch to the deck at more than four anchor points.

In mounting a winch on the deck of a ship it is desired to support the winch on pads which rest on the deck, but which are not directly anchored to the deck but are held in place by anchoring of the winch feet directly to the deck, and to anchor such feet securely to the structure of the vessel.

An object of the present invention is to provide deck pad locating structure which will enable the supporting feet and the pads engaged thereby to be located quickly and easily in proper locations on the ship's deck for supporting the winch. Particularly it is an object to provide such deck pad locators which can be utilized in installing a winch having any number of support feet.

In general, each mounting foot of the winch has a ball-shaped end engaged in an upwardly flaring socket of circular cross section, preferably conical, in a deck pad for relative universal tilting movement and secured by an anchor bolt extending through the deck and preferably also through a deck beam. To locate the holes for the anchor bolts properly a jig can be provided which is supported on pads like the winch-supporting deck pads.

FIG. 1 is an aft top perspective of a representative winch utilizing the winch mounting of the present invention.

FIG. 2 is a top perspective of a drill jig for placing winch-securing holes parts being broken away.

FIG. 3 is a vertical section of a winch foot-supporting deck pad, in which a locator is received; FIG. 4 is a similar view to which a temporary deck pad-holding ring shown in section has been added, and FIG. 5 is a top perspective of the winch foot-supporting deck pad locator and temporary deck pad-holding ring, parts of the deck pad being broken away, and a portion of the deck pad-holding ring being shown in exploded position.

FIG. 6 is a top perspective of a winch-anchoring unit, the parts of which are in exploded relationship, and portions being broken away.

FIG. 7 is a vertical section through the deck pad portion of a winch foot-anchoring unit and temporary holding ring with the foot element of such unit in elevation and disposed in exploded position, and FIG. 8 is a similar view of the winch-anchoring unit with the foot element and deck pad element in assembled relationship and the foot element, as well as the deck pad element, being in vertical section.

The winch of the type shown in FIG. 1 is mounted on the after or amidships deck of a trawler, and the deck D and deck beams B to which the winch is anchored are shown in various figures. The port and starboard winch end frames **5** and **50** of the winch shown in FIG. 1 is of generally triangular profile and formed of members of angle cross section. The lower apexes of the winch end frames are connected by struts **51** to which the winch feet are attached.

In general, the winch shown in FIG. 1 includes a winch drum **6** on which are mounted intermediate flanges **61** and **62** between end flanges **42** and **63**, which are also secured to the winch drum at its opposite ends. The end flange **42** and the adjacent intermediate flange **61** define the side reel **64** between them, the end flange **63** and the intermediate flange **62** define the side reel **65** between them and the two intermediate flanges **61** and **62** define the central reel **66** between them.

Each of the intermediate flanges **61** and **62** has axially-aligned edge notches **68** through which transition sections of the trawl adjacent to the junction of the curtains with the trawl body may pass, so that after the curtains have been wound on the two side reels **64** and **65**, respectively, the body and cod end of the trawl can be wound upon the central reel **66**. The entire drum may be rotated by a motor M carried by the end frame **5** which is controlled by one or the other of the control knobs **21** and **21***a*, which are mounted on and slidable along a guard rail **7**. The motor can be a hydraulic motor or an electric motor, as may be preferred.

The deck D is normally slightly crowned to enable water to drain to the scuppers. Mounting of a winch of the general types described upon such a crowned deck is normally an expensive and laborious job. The mounting shown in the drawings reduces the labor and cost to a minimum and enables the winch to be mounted securely in a fraction of the usual time.

At each corner of a winch such as shown in FIG. 1 the struts **51** are supported by winch-anchoring units. It is important that when installed the winch will have its bearing points located in positions overlying deck beams

B, as shown in FIG. 7, instead of simply resting indiscriminately on the decking. Such location of the bearing points will also enable the winch to be tied down securely to the deck beams when the winch is installed, instead of being anchored only to the decking. Also, it is preferred that despite any slope which the deck may have the four bearing points on the deck coinciding with the four feet of the winch, shown in FIG. 1, will be in coplanar relationship although this is not necessary. If such bearing points on the deck are in coplanar relationship the winch can be supported by feet **52** of nonadjustable character. The lower end of each of these feet is rounded, preferably of hemispherical shape, to constitute a ball element and the upper end of each foot carries an integral saddle **54** having a cylindrically concave surface of a curvature complemental to the curvature of the strut **51** and receiving such strut. Such saddle of each foot is secured to a strut **51** in the proper position lengthwise of it by several machine bolts which are screwed into holes drilled and tapped in the strut.

When the winch has been set the ball ends of the feet **52** will be received in upwardly flaring sockets of circular cross section, preferably of frustoconical shape, in deck pads **8**, which rest on gaskets **80** on the deck D, as shown best in FIG. 8. All of the feet are tied securely to the hull structure by hold-down bolts which extend through a deck beam B and the deck beneath the respective feet and are threaded upwardly into threaded holes extending axially of the feet and radially of their ball ends, as shown in FIG. 8, extending upward centrally through the annular deck pad.

If the slope of the deck beneath the four bearing points of the winch anchoring feet units shown in FIG. 1 is such that those four points are not coplanar when the winch is oriented as desired, at least three of such bearing points will be. At the fourth bearing point an adjustable foot will be employed in which the foot is divided into a lower end portion, having a lower hemispherical end, and an upper cylindrical portion carrying the saddle **54** integral with its upper end.

It will be evident that whether a winch-anchoring foot unit of the type **52**, or of the divided type, is used the foot of the unit can seat in the socket of the deck pad **8** with these two parts interengaged around a small circle of the ball end of the foot with line contact, whatever may be the tilt angle between the top or bottom of the deck pad and the axis of the foot along the bolt-receiving hole through it. Thus, the engagement of the foot's ball end and the socket of the deck pad forms a universal joint so that the deck pad can seat evenly on the deck irrespective of the direction or degree of slope of the deck relative to the axis of the strut **51** to which the anchoring foot unit is attached. Also, the central aperture through the deck pad is sufficiently large to afford ample clearance for passage of the hold-down bolt **81**, irrespective of such angle of tilt. Thus, the winch frame-engaging portion of the foot and the deck-engaging portion of the foot-anchoring unit can be made adjustable in character, both angularly and in length, to enable the foot unit to support the particular portion of the winch frame without special fitting of the unit to the frame, or the deck, and without such unit being subjected to concentrated or off-center stresses.

In installing a winch by the use of the winch mounting described it is important that the several deck pads and hold-down bolt-receiving anchor holes be prelocated so that the feet carried by the winch can simply be set into the sockets of the deck pads when the winch is lowered for placement, instead of it being necessary to hold the winch in slightly suspended position, or to block it up, while some or all of the foot units are located, or their locations adjusted to final position. The correct location of the bolt-anchoring holes and the proper direction of such holes is established by use of a drill jig **82**, shown in FIG. 2. This jig is in the form of a rigid rectangular

frame into which are built inner tubes **83**, the holes through which are of a size to receive snugly a drill bit for drilling the anchor holes for the bolts **81**, and which are disposed in parallel relationship spaced apart distances corresponding to the spacing of the feet for the winch shown in FIG. 1. The frame of this jig has tubes **84** rigidly built into its corners having apertures through them of a size to receive snugly a drill bit for drilling anchor holes for bolts **81**, the bores of which tubes are disposed in parallel relationship.

In addition to the tubular members **38** and **84** the jig **82** includes tubes **85** in the centers of its opposite sides, the bores of which are parallel to the bores of the tubes **83** and **84**. Through these central bores can be inserted snugly fitting locating pins **86**, which can be dropped down to strike a line **87** on the deck D of the trawler that has been marked in a direction corresponding to the desired direction of pull of the winch, which will be fore and aft and at an athwartships location corresponding to the desired position of the center of the winch reel **66**. With the locating pins striking such line special deck pads **88** may be placed under three of the tubes **84**, the lower ends of which are of hemispherical shape. If the transverse curvature of the deck is not uniform it may be desirable to use a tube adjustable in length, such as including inner and outer telescoping sleeves connected by threads for the fourth tube **84** so that the lower ends of the four tubes will bear evenly on the deck pads. The tube end-receiving sockets of the deck pads **88** are frustoconical, as are the sockets of the deck pads **8**, but the deck pads **88** have bottom flanges with apertures in them through which double-headed nails can be driven into the deck to anchor such deck pads securely in place during the anchor hole-drilling operation.

Using the bores of tubes **83** as drill guides, anchor holes for the hold-down bolts **81** are drilled through the deck D and deck beams beneath the deck at the locations of the winch bearing points. If the winch to be set has eight feet instead of four feet additional holes are also drilled through the deck and deck beams using the bores of tubes **84** as drill guides. It is not necessary for the drill jig to be supported at the locations of these tubes because the drill will be held sufficiently closely in their bores so that the drill will engage the deck in the proper position, even though it is exposed between the lower end of the tube **84** and the deck. When the required bolt anchor holes have thus been drilled the drill jig will be lifted from the deck pads **88**, the nails will be pulled out of the flanges of these pads and such pads will be removed from the positions on the deck in which they were secured during the anchor hole-drilling operation.

The next step in the winch installing procedure is illustrated in FIGS. 3, 4 and 5. A gasket **80** is placed in position encircling each of the anchor holes drilled by use of the jig shown in FIG. 2, as described above, and a deck pad **8** is placed upon such gasket. If the portions of the deck at the locations of the four deck pads is not coplanar it will be necessary to adjust the adjustable tube sufficiently to bring the lower ends of all four tubes **84** into coplanar relationship. Each gasket and deck pad is then positioned accurately in concentric relationship to the hold-down bolt anchor hole by inserting into such hole the stem of a locator **89**. On the upper end of this stem is a head **89'** in the form of a ball having a radius approximately equal to the radius of the hemispherical end of a foot. As this locator is pressed downward from the position shown in broken lines in FIG. 3 into the position shown in solid lines by application of force to the handle provided on the ball, the deck pad will be shifted by engagement of the ball with the conical socket of the deck pad in whatever direction is necessary to enable the ball to bear evenly around a small circle on the deck pad socket. When the deck pad and gasket have thus been located precisely relative to the anchor hole through the deck and deck beam, the deck pad will be secured in such position

by confiining ring sections **100**. Conveniently, two of such sections, each of semicircular extent, as shown in FIG. 5, may be used. These confining ring sections may be of T-bar section, having an upwardly extending flange in which spaced notches are provided. Through such ring sections at the location of each notch is a hole through which a double-headed anchor nail can be driven to secure the confining ring section in place for preventing lateral displacement of a deck pad. The depth of such notches, as shown in FIG. 4, is such that the upper head of the anchor nail driven through the aperture in the notch will project above the adjacent portion of the ring section flange so that such nail can be pulled readily.

When each deck pad has been secured in position by encircling confining ring sections **100**, as shown in FIG. 4, the locator **89** can be pulled out of the hold-down bolt anchoring hole by grasping the handle of the locator. The sealing collar **56** of the anchoring foot unit shown in FIG. 6 is then placed in the socket of the deck pad, as shown in FIG. 7. This sealing collar has a lower cylindrical tubular portion which fits into the central aperture of the deck pad and an upper portion **55** flaring upwardly and tapering from the cylindrical portion at an external angle complemental to the conical shape of the deck pad socket. The upper portion of this sealing collar extends upwardly sufficiently far so that it will be engaged by the hemispherical portion of the winch foot **52** when it is placed in the socket. Also, such sealing collar is made of soft yieldable material, which preferably is resilient, such as being of elastomeric material, so that it will be deformed by engagement of the winch foot with it and will effect a watertight seal between the ball end of the winch foot and the deck pad socket.

When all of the deck pads **8** for the particular winch have thus been located precisely and held in position by confining ring sections **100** and the sealing collars **56** have been placed in them, as shown in FIG. 7, the winch is hoisted, swung into position and guided as it is lowered to effect movement of the feet **52** from raised positions, such as shown in FIG. 7, into the lowered positions of FIG. 8. Because of the preparatory procedure described it will be found that each winch foot fits accurately into the conical socket of its corresponding deck pad **8**. Moreover, the axially extending aperture in each foot will be aligned precisely with the hold-down bolt anchor hole drilled in the deck D and deck beam B. It is therefore only necessary to insert the anchor bolt **81** from below upward through such hole and to screw it into the tapped

bore of the winch foot, as shown in FIG. 8. Preferably a large washer will be provided on each bolt against which the bolt head will bear and the washer will bear on the bottom of the deck beam. If the bolt anchor hole is not precisely perpendicular to the bottom of the deck beam there may be a slight tilt between the washer and the bolt, but this should not be great enough to affect adversely the anchoring action of the bolt. Any such tilt of the washer relative to the bolt may, however, be obviated by trimming, or countersinking, the lower side of the deck beam slightly to provide a seat for the washer which is precisely perpendicular to the axis of the bolt-anchoring hole. When the hold-down bolts have thus been secured the nails can be pulled from the confining ring sections **10** encircling the deck pads **8**, so that such ring sections can be removed.

I claim:

1. The method of mounting on a nonplanar deck a winch supported by a plurality of feet, which comprises placing a jig on the winch-supporting surface for locating on such surface the positions of holes corresponding to the locations of the feet on the winch, drilling holes in the winch-supporting surface utilizing the jig for such drilling, locating deck pads having holes therethrough in positions on the winch-supporting surface corresponding to such drilled holes, securing such deck pads in such respective locations on the winch-supporting surface, setting the winch with its feet engaged, respectively, in the sockets of the deck pads, and securing the winch feet in such deck pads by bolts extending through the winch feet and the holes drilled in the winch-supporting surface.

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CHARLIE T. MOON, Primary Examiner

U.S. Cl. X.R.

29—526; 248 19