July 8, 1952 W. A. MEIGHAN 2,602,690

QUICK RELEASABLE SHIP CLAMP

Filed May 16, 1951 2 SHEETS--SHEET 1

Fig. 1.

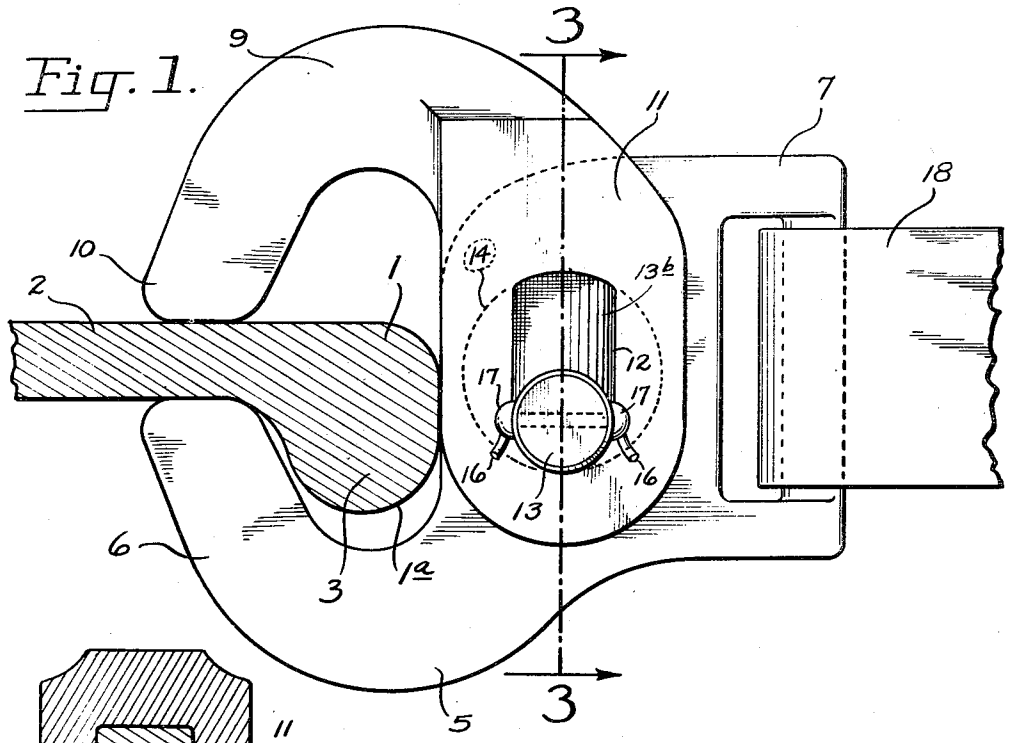


Fig. 3.

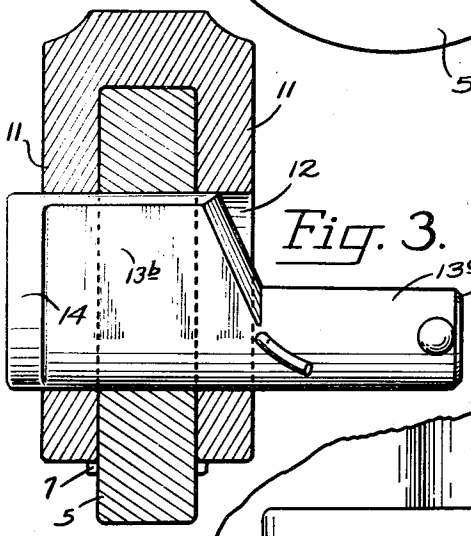


Fig. 2.

INVENTOR.
William A. Meighan
BY
Atty.

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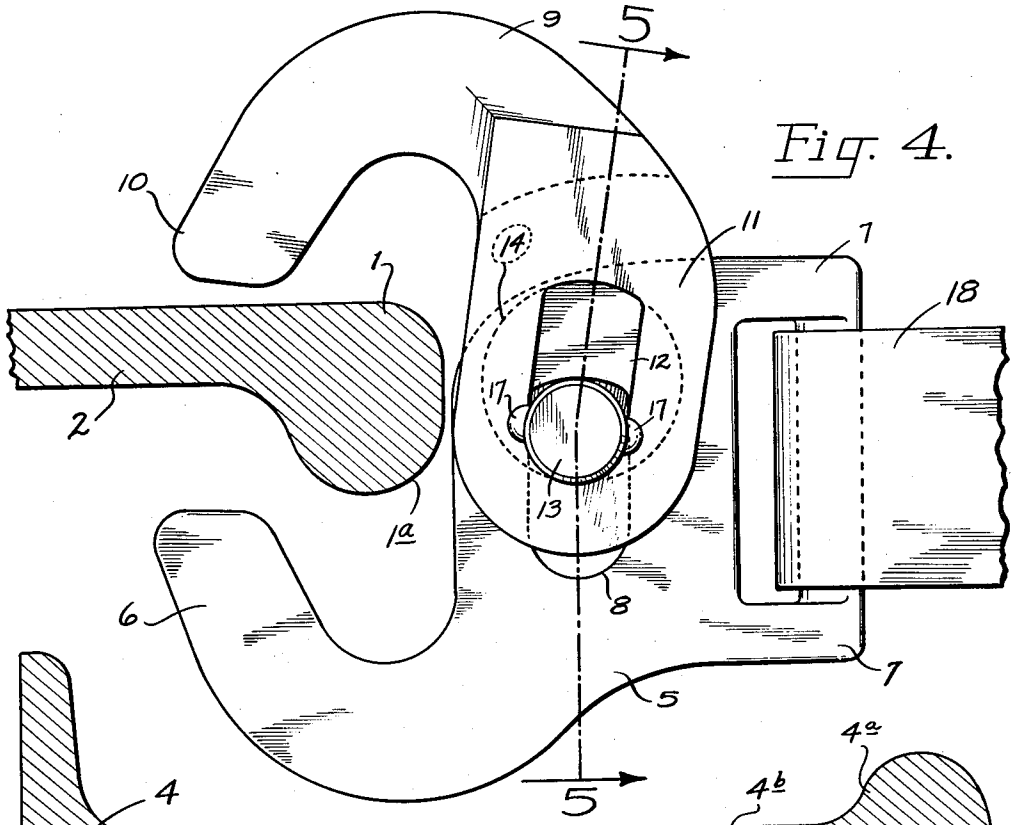


Fig. 4.

Fig. 6.

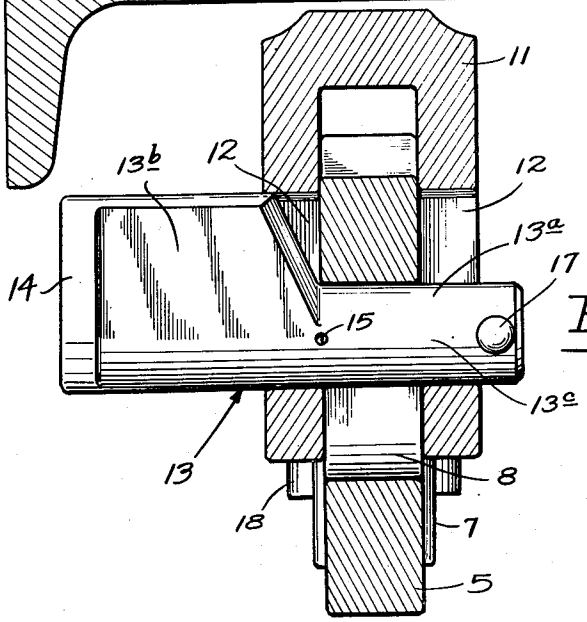


Fig. 5.

INVENTOR.
William A. Meighan
BY
Atty.

Patented July 8, 1952 2,602,690

UNITED STATES PATENT OFFICE

2,602,690

QUICK RELEASABLE SHIP CLAMP

William A. Meighan, Oswego, Oreg.

Application May 16, 1951, Serial No. 226,640

7 Claims. (Cl. 294—106)

1

My invention relates to a ship clamp which is adapted to grip the marginal edge of the web of a ship hull rib, so that cables or straps may be secured thereto and stretched across a ship hold or attached to pieces of cargo to prevent the shifting thereof.

One of the principal objects of my invention is to provide a two-piece ship clamp which may quickly be arranged in engagement with a bulbous, web-type ship hull rib, and when it is to be released, this may easily be done by shifting a keeper pin, which permits the jaws of the clamp to be relaxed in their grip upon the rib and separated to permit detachment therefrom.

My invention relates to the same general subject matter as the copending application for patent entitled Ship Clamp, in which I am one of joint inventors with Tirey L. Hume, said application bearing Serial No. 166,495 and filed June 6, 1950.

Ship clamps are provided in ocean going cargo vessels to prevent the cargo which is being transported from shifting in the hold. This is particularly a problem when grain or other fungible goods are carried in a hold because grain is quite a fluid cargo, and if said cargo shifts, it changes the ship's center of gravity substantially as a ship pitches or rolls from side to side. With non-fungible goods, such as heavy machinery, it is necessarily secured tightly in place. Thus, heavy cables or metal straps are secured to said pieces of cargo, which cables or straps may be secured to the ship hull ribs or to other fastening devices.

The ribs of a ship are elongated, vertical members and may take the form of Z-bars, channels, or bulb channels or angles. The skin of a ship is welded or riveted to said ribs. In any event, as viewed from the inside of a hold, a typical rib is formed with a flange projecting inwardly from the skin of the ship, and said web is arranged more or less normal to the plane of said skin. In case of a bulb channel or angle, said inwardly projecting rib terminates in an enlarged, bulbous margin. This type of rib is more commonly provided for ships not made in the United States, and my invention is shown in connection with such a bulbous type of rib. It is to be understood, however, that it has equal application to Z-bars, channels, and angles, in which the flange terminates in a laterally projecting margin of substantially the same thickness as the intermediate projecting web which extends normal to the plane of the skin of the ship. The clamps are formed to engage a fairly wide range of shapes and sizes, and the structures illustrated herein are to be deemed typical of such jaws and not to be limited to the exact shape thereof.

My present invention is more particularly directed to that phase thereof which permits a clamp to be quickly attached to a rib and, with

2

equal facility, to be disengaged therefrom by means of a lateral, shiftable keeper pin. The use of such a keeper pin permits the clamp to be quickly disengaged from a ship's rib by striking the keeper pin with a hammer or maul, which causes the jaws of the clamp to be relaxed and permits it to be removed from the vertical rib.

A further and more specific object of my invention is to provide a releasable ship clamp which is capable of being secured either to the ribs on the port side or on the starboard side merely by shifting it about or turning said ship clamp over to accommodate the conformation of the ribs at said sides, respectively.

These and other objects and advantages of my invention are hereinafter described in connection with the accompanying drawings, in which:

Fig. 1 is a plan view of a quick releasable ship clamp embodying my invention, shown in engagement with a bulbous-type ship rib, which ship rib is shown in fragmentary form and in section;

Fig. 2 is an elevation of a quick detachable ship clamp embodying my invention, shown in engagement with a fragmentary portion of a bulbous-type ship rib;

Fig. 3 is a transverse sectional view along the plane of the keeper pin, said section being taken along the line 3—3 in Fig. 1;

Fig. 4 is a view similar to Fig. 1, except that the quick releasable ship clamp is shown in opened or detachable position, and the jaws are shown spread apart, as is required either to attach said clamp to the marginal flange of said rib initially, or to detach it therefrom;

Fig. 5 is a transverse sectional view taken on the line 5—5 in Fig. 4, showing the keeper pin laterally displaced to permit the jaws of the ship clamp to open; and

Fig. 6 is a transverse section through a slightly different type of a ship rib, known as a bulb beam, said bulb beam being symmetrical about a transverse axis, while a bulb angle, shown in connection with the remaining views, has it bulbous marginal portion extending laterally from the outstanding web thereof.

A ship clamp embodying my invention is adapted to grip the outstanding web 1 of a ship hull rib 2. Said ribs may be of any conventional form, such as Z-bars or other ship channels, or may be of the bulbous type. In Figs. 1 to 4, inclusive, said ship clamp is shown in connection with a bulb angle 3. This is of angular form and the outstanding web 1 terminates in an offset bulbous marginal edge 1a. In Fig. 6, there is illustrated a section of a bulb beam 4, having a symmetrical marginal edge 4a. The cooperating jaws of a ship clamp are shown as designed to accommodate bulbous-type angles or beams. They differ only in that in a bulb angle the marginal edge 1a extends laterally from the web and is not

symmetrical therewith. In a bulb beam type, the marginal edge 4a extends laterally in both directions and is symmetrical with the outstanding web 4b thereof.

A ship clamp embodying my invention comprises a body member 5, terminating in a hook portion 6. Said hook portion constitutes one of a pair of gripping jaws, which encircle the marginal edge 1a of a ship rib and grip between them the web 1, as is illustrated in Fig. 1. The opposite end of said body member terminates in a loop portion 7. This loop portion is illustrated as being of rectangular profile, such, for example, as to accommodate a strap. If a clamp were adapted to engage a wire rope, said loop preferably would be of circular outline. Intermediate the loop portion and the hook portion is an elongated eye 8. The major dimension of said eye extends substantially transversely of the longitudinal dimension of the body, thus permitting said body and jaw member 9 to shift laterally and to open and close for disengagement and engagement with the web 1. Said jaw member terminates at one end in a downturned hook portion 10 and at the other end in a bifurcated portion 11. The hook portions 6 and 10, respectively, on the body and jaw members are adapted to oppose each other and together to form jaw members for the ship clamp. The bifurcated portion 11 is positioned and arranged to extend substantially transversely of the longitudinal dimensions of the body, and a pair of registering eyes 12, of similar outline to the eye 8 in the body, can move into alignment therewith when the jaws are closed, as shown in Fig. 1. The bifurcated portion of the hook member overlies the portion 8a of the body surrounding the eye 8, and the bifurcated portion 11 straddles said overlying portion 8a so that the jaw and body members are held against tipping or canting.

Extending transversely through the eyes 8 and 12 in the body and jaw portions, respectively, is a keeper pin 13. Said keeper pin is substantially twice as long as the overall thickness of the overlying portions 8a and 11, of the body and jaw members, respectively. This is illustrated in Fig. 2. One end of the keeper pin is formed into a head 14, which bears against the under face of the bifurcated portion 11 of the jaw member, as viewed in Fig. 2. Said head is of sufficient diameter to prevent said keeper pin from sliding upwardly, as viewed in said Fig. 2, when the head is in face-to-face abutment with said bifurcated portion. Substantially at a point midway of the shank 13a of said keeper pin is a transverse hole 15. A cotter key or piece of bent wire 16 may be passed through said hole and deformed to prevent inadvertent retraction, and said deformation keeps the keeper pin from moving downwardly, as viewed in Fig. 2. That portion 13b of the shank 13a lying below the hole 15, as viewed in said Fig. 2, and extending to the head 14 is of elongated section, as is viewed in Fig. 1; that is, the portion 13b of said shank, extending from the hole 15 to the head 14, is of a size that it has a cross-sectional area and form corresponding generally to the outline of the registering eyes 8 and 12, respectively. Thus, when said portion 13b lies in said eyes, it substantially fills them and prevents pivotal and lateral movement of the jaw member with respect to the body member, and thus holds the hook portions, constituting the jaws of the ship clamp, from spreading apart. The portion 13c of the shank of the keeper pin 13 at the other side of the hole 15 is of circular section, and it is of a diameter corresponding generally to the minor dimension of the elongated section 13b. That is to say, the portion 13c is of circular section and it lies between the planes of the elongated faces of the elongated noncircular section, as is shown most clearly in Fig. 1.

At the end of the keeper pin away from the head 14 is a headed rivet 17, which extends through the portion 13c at right angles to the flattened sides of the elongated eyes 8 and 12, respectively. Said rivet serves to prevent the keeper pin from being physically separated from the body and jaw members, and limits the downward movement of the keeper pin, as viewed in Fig. 2. This stop is formed as a headed rivet 17 so that it can be inserted through the keeper pin after it is in place; that is, after the ship clamp is assembled. If the parts become broken or need replacement or repair for any reason, the jaw member and the body member may be separated and replaced merely by knocking out said rivet, separating the body and jaw members, and thereafter by replacing a rivet or pin, the latter will prevent separation.

My improved ship clamp is used as follows:

The parts are arranged as is shown in Fig. 4 when they are to be secured to the marginal edge of the web of a ship hull rib. To permit the jaw to swing outwardly, the keeper pin is moved downwardly by removing the cotter key or piece of bent wire 16. The pin may then drop down until the rivet 17 bears against the upper face of the bifurcated portion 11 of the jaw member 9. The jaws then may be forced open and pivoted about the portion 13c of the keeper pin 13, as is indicated in Fig. 4. The points of the jaws then are separated sufficiently to pass the marginal edges of the bulbous rim or marginal edge 1a of the web 1.

The jaws may then be pushed together to assume the position shown in Fig. 1, and the keeper pin is pushed upwardly as shown in Fig. 2, so that the portion 13b of the shank of the keeper pin 13 will enter the registering eyes 8 and 12. Because of the noncircular form of said portion 13b of the keeper pin shank, and the fact that this portion substantially completely fills the eyes, this will prevent the jaws from relaxing their grip upon the web 1 and about the marginal edge 1a. A cotter key or piece of bent wire is then placed through in position in the hole 15, and this holds the ship clamp in place. I have found that it is not essential with this clamp, to grip the web tightly because there is an offcenter disposition of mass which tends to cant the ship clamp slightly, and as soon as it depends slightly from horizontal plane, to wedge it in position. Then one end of a band 18 may be slipped through the loop portion 7 and tightened. This may be done with a device such as is illustrated in the copending application for United States patent entitled Tensioning and Joining Device for Strap Ends, disclosed in the copending application for patent filed by myself and Tirey L. Hume under date of June 6, 1950, Serial No. 166,494. The strap or band 18 is made quite tight and this prevents the ship clamp from moving upon the web 1 of the rib. If the band or strap is used to extend laterally across a hold, the latter may then be filled with cargo, and after the cargo is ready to be discharged or thereafter, the tension upon the band or strap 18 may be relaxed and the ship clamp may be removed from engagement with the web merely by cutting or removing the wire or cotter key 16 and forcing the pin downwardly as viewed

in Fig. 2, either manually or by the use of a hammer or maul. When the portion 13c of the keeper pin lies in the registering eyes 8 and 12, respectively, the jaws may be opened to the position shown in Fig. 4 and the clamps removed from the web.

As is shown in Figs. 1 and 4, the hook portion 10 is allochiral with the hook portion 6 on the body, and thus if the clamp is to be used on the opposite side of a vessel, this may be done either by turning the clamp over or by leaving it the same side up, depending on whether the installer wishes to keep the keeper pin with its shank extending upwardly from or to depend from the clamp. If the ship clamp is to be used in connection with a bulb beam such as is shown in Fig. 6, it makes no difference which position the clamp occupies, because the jaws are symmetrical about a longitudinal axis, as is the bulb beam.

Although I have shown the jaw member as having a bifurcated end to straddle and overlie the intermediate portion of the body member 5, it is to be understood that the body could be made bifurcated to receive a flat end for the jaw member. I believe it is desirable, however, to bifurcate the jaw member and provide the body member with plane sides as shown in Fig. 2, because this provides a better disposition of material and economy in manufacture. This arrangement also produces a straight line pull throughout the thickness of the body member, as is illustrated in Fig. 2, inasmuch as the body is of substantially uniform thickness throughout its entire length.

I claim:

1. A two-piece ship clamp for gripping the outstanding web of a ship hull rib, comprising a body member having a hook portion at one end and a strap engaging loop at the other end, a jaw member associated therewith having a complementary hook portion serving with the hook portion of the body member to encircle and grip the marginal edge of the web of a ship hull rib, overlying portions of said jaw and body members, respectively, having transverse elongated registering eyes formed therein, said registering eyes each being of elongated noncircular outline, and a keeper pin having a shank extending through said registering eyes and being longitudinally slidable therein, said keeper pin shank being longer than the overall thickness of said overlying portions of the body and jaw members, one portion of the length of the keeper pin shank being of elongated noncircular section corresponding to the outline of the registering eyes in the body and jaw members, respectively, and the other portion of said shank being of circular outline lying wholly within the outline of the elongated noncircular section of said shank, whereby when the keeper pin is arranged with its noncircular portion lying within and in engagement with the registering eyes in the body and jaw portions, said portions are held fixed to grip the marginal edges of the web of a ship hull rib and when the reduced circular portion is in engagement with said eyes said body and jaw members are free to swing open and to relax engagement with the marginal edge of the web of a ship hull rib.

2. A two-piece ship clamp for gripping the outstanding web of a ship hull rib, comprising a body member having a hook portion at one end and a strap engaging loop at the other end, a jaw member associated therewith having a complementary hook portion serving with the hook portion of the body member to encircle and grip the marginal edge of the web of a ship hull rib, overlying portions of said jaw and body members, respectively, having transverse elongated registering eyes formed therein, said registering eyes each being of elongated noncircular outline, said keeper pin shank being substantially twice as long as the overall thickness of said overlying portions of the body and jaw members, one half of the keeper pin shank being of elongated noncircular section corresponding to the outline of the registering eyes in the body and jaw members, respectively, and the other half of said shank being of circular outline lying wholly within the outline of the elongated noncircular section of said shank, whereby when the keeper pin is arranged with its noncircular portion lying within and in engagement with the registering eyes in the body and jaw portions, said portions are held fixed to grip the marginal edge of the web of a ship hull rib and when the reduced circular portion is in engagement with said eyes said body and jaw members are free to swing open and to relax engagement with the marginal edge of the web of a ship hull rib.

3. A two-piece ship clamp for gripping the outstanding web of a ship hull rib, comprising a body member having a hook portion at one end and a strap engaging loop at the other end, a jaw member associated therewith having a complementary hook portion serving with the hook portion of the body member to encircle and grip the marginal edge of the web of a ship hull rib, overlying portions of said jaw and body members, respectively, the overlying portion of one of said members being bifurcated and straddling the overlying portion of the other member, said overlying portions, respectively, having transverse elongated registering eyes formed therein, said registering eyes each being of elongated noncircular outline, and a keeper pin having a shank extending through said registering eyes, and being longitudinally slidable therein, said keeper pin shank being longer than the overall thickness of said overlying portions of the body and jaw members, one portion of the length of the keeper pin shank being of elongated noncircular section corresponding to the outline of the registering eyes in the body and jaw members, respectively, and the other portion of said shank being of circular outline lying wholly within the outline of the elongated noncircular section of said shank, whereby when the keeper pin is arranged with its noncircular portion lying with and in engagement with the registering eyes in the body and jaw portions, said portions are held fixed to grip the marginal edge of the web of a ship hull rib and when the reduced circular portion is in engagement with said eyes said body and jaw members are free to swing open and to relax engagement with the marginal edge of the web of a ship hull rib.

4. A two-piece ship clamp for gripping the outstanding web of a ship hull rib, comprising a body member having a hook portion at one end and a strap engaging loop at the other end, a jaw member associated therewith having a complementary hook portion serving with the hook portion of the body member to encircle and grip the marginal edge of the web of a ship hull rib, overlying portions of said jaw and body members, respectively, having transverse elongated registering eyes formed therein, the overlying

portion of the body member lying intermediate the jaw portion thereof and the loop formed therein, said registering eyes each being of elongated noncircular outline, and a keeper pin having a shank extending through said registering eyes, and being longitudinally slidable therein, said keeper pin shank being longer than the overall thickness of said overlying portions of the body and jaw members, one portion of the length of the keeper pin shank being of elongated noncircular section corresponding to the outline of the registering eyes in the body and jaw members, respectively, and the other portion of said shank being of circular outline lying wholly within the outline of the elongated noncircular section of said shank, whereby when the keeper pin is arranged with its noncircular portion lying within and in engagement with the registering eyes in the body and jaw portions, said portions are held fixed to grip the marginal edge of the web of a ship hull rib and when the reduced circular portion is in engagement with said eyes said body and jaw members are free to swing open and to relax engagement with the marginal edge of the web of a ship hull rib.

5. A two-piece ship clamp for gripping the outstanding web of a ship hull rib, comprising a body member having a hook portion at one end and a strap engaging loop at the other end, a jaw member associated therewith having a complementary hook portion serving with the hook portion of the body member to encircle and grip the marginal edge of the web of a ship hull rib, overlying portions of said jaw and body members, respectively, having transverse elongated registering eyes formed therein, said registering eyes each being of elongated noncircular outline, and a keeper pin having a shank extending through said registering eyes, and being longitudinally slidable therein, said keeper pin shank being longer than the overall thickness of said overlying portions of the body and jaw members, one portion of the length of the keeper pin shank being of elongated noncircular section corresponding to the outline of the registering eyes in the body and jaw members, respectively, and the other portion of said shank being of circular outline lying wholly within the outline of the elongated noncircular section of said shank, whereby when the keeper pin is arranged with its noncircular portion lying within and in engagement with the registering eyes in the body and jaw portions, said portions are held fixed to grip the marginal edge of the web of a ship hull rib and when the reduced circular portion is in engagement with said eyes said body and jaw members are free to swing open and to relax engagement with the marginal edge of the web of a ship hull rib, and a releasable detent for holding the noncircular portion of the shank of said keeper pin in engagement with said registering eyes.

6. A two-piece ship clamp for gripping the outstanding web of a ship hull rib, comprising a body member having a hook portion at one end and a strap engaging loop at the other end, a jaw member associated therewith having a complementary hook portion serving with the hook portion of the body member to encircle and grip the marginal edge of the web of a ship hull rib, overlying portions of said jaw and body members, respectively, having transverse elongated registering eyes formed therein, said registering eyes each being of elongated noncircular outline, and a keeper pin having a shank extending through said registering eyes, and being longitudinally slidable therein, said keeper pin shank being longer than the overall thickness of said overlying portions of the body and jaw members, one portion of the length of the keeper pin shank being of elongated noncircular section corresponding to the outline of the registering eyes in the body and jaw members, respectively, and the other portion of said shank being of circular outline lying wholly within the outline of the elongated noncircular section of said shank, whereby when the keeper pin is arranged with its noncircular portion lying within and in engagement with the registering eyes in the body and jaw portions, said portions are held fixed to grip the marginal edge of the web of a ship hull rib and when the reduced circular portion is in engagement with said eyes said body and jaw members are free to swing open and to relax engagement with the marginal edge of the web of a ship hull rib, and a releasable diametric pin extending through the shank of said keeper pin for holding the noncircular portion of the shank of said keeper pin in engagement with said registering eyes.

7. A two-piece ship clamp for gripping the outstanding web of a ship hull rib, comprising a body member having a hook portion at one end and a strap engaging loop at the other end, a jaw member associated therewith having a complementary hook portion serving with the hook portion of the body member to encircle and grip the marginal edge of the web of a ship hull rib, overlying portions of said jaw and body members, respectively, said portions, respectively, having transverse elongated registering eyes formed therein, said registering eyes each being of elongated noncircular outline, and a keeper pin having a shank extending through said registering eyes, and being longitudinally slidable therein, said keeper pin having enlarged heads at the ends thereof to limit the physical removal of said keeper pin from engagement with said members and the eyes therein, said keeper pin shank being longer than the overall thickness of said overlying portions of the body and jaw members, one portion of the length of the keeper pin shank being of elongated noncircular section corresponding to the outline of the registering eyes in the body and jaw members, respectively, and the other portion of said shank being of circular outline lying wholly within the outline of the elongated noncircular section of said shank, whereby when the keeper pin is arranged with its noncircular portion lying within and in engagement with the registering eyes in the body and jaw portions, said portions are held fixed to grip the marginal edge of the web of a ship hull rib and when the reduced circular portion is in engagement with said eyes said body and jaw members are free to swing open and to relax engagement with the marginal edge of the web of a ship hull rib.

WILLIAM A. MEIGHAN.

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