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BOAT HULL PATCH

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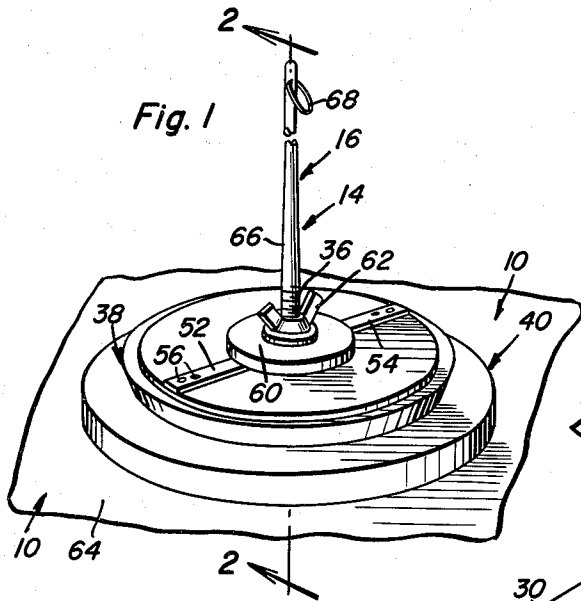
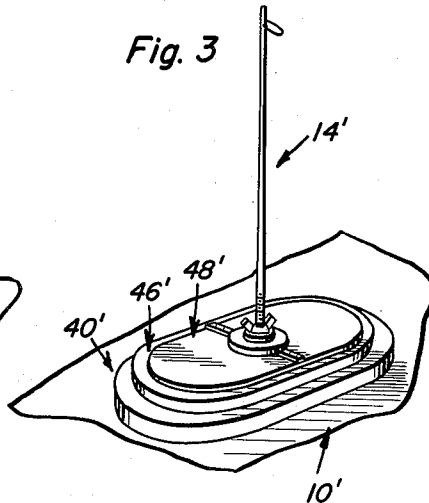


Fig. 2

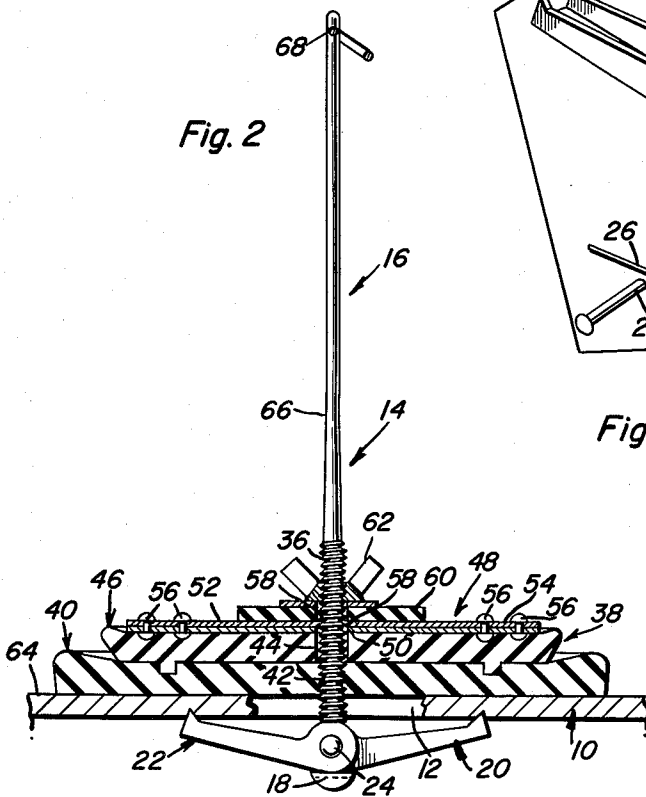


Fig. 4

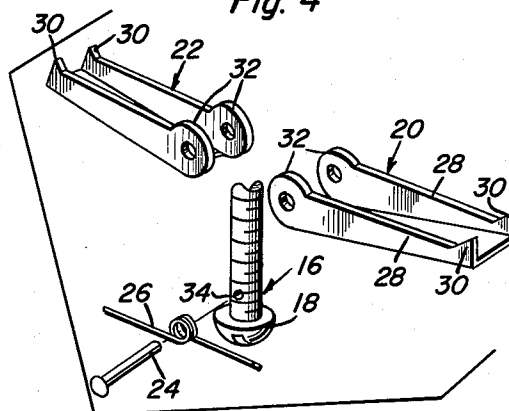
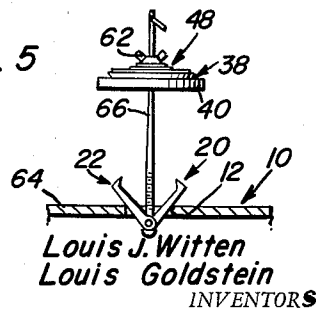


Fig. 5



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BOAT HULL PATCH

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4 Claims. (Cl. 114-227)

This invention relates to a novel and useful boat hull patch and more specifically to a boat hull patch assembly for making an emergency repair of a punctured boat hull panel.

Wooden boat hull panels are sometimes punctured by driftwood and the like upon impact of a boat hull with pieces of driftwood while the boat is traveling at high speeds and if the puncture in the boat hull is below the waterline the interior of the boat can rapidly fill with water and sink.

While the boat hull patch assembly of the instant invention has been primarily designed for making quick emergency repairs of boat hulls which have been punctured below the waterline, it is to be understood that the patch assembly of the instant invention may also be used to repair boat hulls which have been punctured above the waterline.

The main object of this invention is to provide a boat hull patch assembly which may be utilized for making a quick emergency repair of a punctured boat hull panel from the interior of the boat hull.

Another object of this invention, in accordance with the immediately preceding object, is to provide a boat hull patch assembly which may be constructed in a manner to readily adapt itself to various size punctures.

Still another object of this invention is to provide a boat hull patch assembly constructed in a manner whereby it may conform to curved boat hull panels as well as substantially flat boat hull panels.

A further object of this invention is to provide a boat hull patch assembly utilizing an elongated support shank having pivoted anchor arms secured to one end which may be moved from between retracted positions extending generally parallel to the support shank and extended positions extending generally radially outwardly of the support shank with means being provided for normally resiliently urging the anchor arms toward the extended position in order that they may be retracted in order to be inserted through an opening formed in a boat panel from the interior thereof and allowed to move to the extended position after having been passed through the opening in order to engage the outer surfaces of the boat hull panel on opposite sides of the opening formed therein. In this manner, a centrally apertured sealing disk may be slidably disposed on the support shank and moved into frictional and sealing engagement with the internal surfaces of the boat hull panel disposed about the puncture opening formed therein. Thereafter, a jamnut or the like may be engaged with the shank which is externally threaded and utilized to secure the sealing disk in tight frictional engagement with the internal surfaces of the boat hull disposed about the rupture opening formed therein.

A further object of this invention is to provide a support shank which includes a diametrically reduced portion on which the jamnut is loosely slidably disposed and to form the diametrically reduced portion on the end of the shank remote from the anchor arms whereby the sealing disk may be first disposed in a retracted position away from the anchor arms before the anchor arms are inserted through the rupture formed in the hull in order that sufficient clearance will be provided to enable the anchor arms to be pivoted to their retracted positions generally paralleling the shank. Thereafter, as soon as the anchor arms have been inserted through the opening

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and they have been urged to the extended positions, the end of the shank disposed interiorly of the boat may be pulled inwardly while at the same time sliding the sealing disk forwardly along the shank to engaging the inner surfaces of the boat hull. Thereafter, the jamnut may be slid freely along the diametrically reduced portion of the shank until the threads formed on the latter are engaged. Then, a few turns of the jamnut will be sufficient to secure the sealing disk in tight frictional engagement with the internal surfaces of the boat hull. In this manner, the number of turns required to move the jamnut in abutting engagement with the sealing disk after the anchor arms have been inserted through the opening formed in the boat hull are greatly reduced.

A final object to be specifically enumerated herein is to provide a boat hull patch which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the boat hull patch shown secured to a boat hull panel;

FIGURE 2 is an enlarged sectional view taken substantially upon the plane indicated by the section line 2-2 of FIGURE 1;

FIGURE 3 is a perspective view similar to that of FIGURE 1 but showing a modified form of boat hull patch;

FIGURE 4 is an exploded perspective view of the anchor end portion of the support shank of the boat hull patch; and

FIGURE 5 is a sectional view similar to that of FIGURE 2 but on a somewhat reduced scale and showing the manner in which the anchor end of the support shank is first inserted through the opening formed in the boat hull panel.

Referring now more specifically to the drawings the numeral 10 generally designates a boat hull panel which has had an opening 12 formed therein. The boat hull patch of the instant invention is generally designated by the reference numeral 14 and includes an elongated support shank generally referred to by the reference numeral 16. One end of the support shank 16 has a head portion 18 formed thereon and a pair of anchor arms generally referred to by the reference numerals 20 and 22 are pivotally secured to the shank 16 adjacent the head 18 thereof by means of a pivot pin 24 and are normally urged toward a radially extending operative position such as that illustrated in FIGURE 2 of the drawings by means of a spring 26.

It will be noted that each of the anchor arms 20 is generally U-shaped in cross section and that the side flanges 28 of each are provided with hull engaging points 30 on one end and apertured ear portions 32 on the other end portion by which the anchor arms 20 and 22 are secured to the shank 16. It will be noted that the pivot pin 24 is passed through the apertured ear portions 32 and the transverse bore 34 formed in the shank 16.

The shank 16 is externally threaded as at 36 from a point spaced from the head 18 a distance somewhat greater than the width of the sealing disk assembly generally referred to by the reference numeral 38 forwardly toward the head 18.

The sealing disk assembly includes a large flexible and resilient pad generally referred to by the reference nu-

meral 40 which is provided with a centrally disposed bore 42 that snugly receives the threaded portion of the shank 16. A stiffener pad or washer which is provided with a central bore 44 and is generally designated by the reference numeral 46 is secured to the face of the pad 40 remote from the head 18 in any convenient manner such as by bonding. A retaining or thrust washer generally referred to by the reference numeral 48 is provided and includes a central bore 50 for slidably receiving the threaded portion of the shank 16. However, a plurality of generally radially extending leaf springs 52 and 54 are carried by the thrust washer 48 and are secured thereto at their outer ends by means of suitable fasteners 56. The inner ends of the springs 52 and 54 project inwardly of the sides of the bore 50 and are provided with longitudinally opening recesses 58 for partially encircling the threaded portion of the shank 16 from opposite sides thereof and between the threads 36 formed thereon.

A resilient washer 60 is also disposed on the threaded portion 36 of the shank 16 and is disposed on the side of the thrust washer 48 remote from the pads 40 and 46. Then, a jamnut 62 is threadedly engaged on the threaded portion 36 of the shank 16 and is utilized to urge the pad 40 into tight frictional engagement with the internal surfaces 64 of the boat hull panel 10 disposed about the opening 12 formed therein.

The shank 16 includes a diametrically reduced portion 66 and the end thereof remote from the head 18 is provided with abutment means in the form of a support ring 68 which may be utilized to hang the patch assembly 14 and is also utilized to prevent any portions of the boat hull patch assembly 14 slidably mounted on the shank 16 from accidentally falling from the end thereof remote from the head 18.

In installing the boat hull patch assembly 14, the pads 40 and 46, the washers 48 and 60 and the jamnut 62 are first positioned as illustrated in FIGURE 5 of the drawings. Then, the headed end of the shank 16 may be inserted through the opening 12 which will automatically swing the anchor arms 20 and 22 toward a retracted position. After the free ends of the anchor arms 20 and 22 have been passed through the opening 12, the arms 20 and 22 will be urged toward their extended position illustrated in FIGURE 2 of the drawings by means of spring 26. Then, the washers 40, 46, 48 and 60 may be rapidly slid longitudinally of the shank 16 toward the head 18 and positioned with the pad 40 in frictional engagement with the internal surface 64 of the boat hull 10. As the washer 48 is moved over the threaded portion 36, the free ends of the leaf springs 52 and 54 will be laterally deflected. However, after the washer 48 has been positioned as illustrated in FIGURE 2 of the drawings, the engagement of the leaf springs 52 and 54 with the threaded portion of the shank 16 will prevent movement of the washer 48 toward the diametrically reduced end portion of the shank 16.

If it is desired to move the washer 48 from the position illustrated in FIGURE 2 of the drawings toward the diametrically reduced end portion of the shank 16, the washer 48 may be rotated in a counterclockwise direction as seen from the diametrically reduced end portion of the shank 16 whereupon it may be threaded backwardly along the threaded portion 36 of the shank 16 in the same manner in which the jamnut 62 may be moved longitudinally of the threaded portion of the shank 16. However, immediately upon movement of the pad 40 into engagement with the internal surfaces 64 of the boat hull 10 the leaf springs 52 and 54 will hold the pad 40 in engagement with the hull and substantially stop all water from coming in through the opening 12. Then, the jamnut 62 may be similarly slid longitudinally of the diametrically reduced end portion 66 and engage with the threads 36 and then turned a few turns until moved into tight engagement with the washer 60. After the jamnut 62 has been tightly secured, the boat hull patch assembly 14 will pre-

vent substantially all water from entering through the opening 12.

With attention now directed to FIGURE 3 of the drawings there will be seen a modified form of boat hull patch assembly generally referred to by the reference numeral 14'. The boat hull patch assembly 14' is substantially identical to the boat hull patch assembly 14 with the exception being that the washers 40', 46' and 48' are oval shaped in plan rather than being circular. It is of course understood that this modified form of boat patch assembly 14' is to be used for repairing relatively long and narrow ruptures formed in a boat hull 10'.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A boat hull patch assembly for making an emergency repair of a punctured boat hull panel, said patch assembly comprising an elongated support shank, a pair of anchor arms pivotally secured to one end of said shank for movement about axes extending transversely of said shank and of said anchor arms between generally radially outwardly extending positions and collapsed positions generally paralleling said shank and with the free ends thereof extending toward the other end of said shank, a centrally apertured large diameter sealing disk slidably disposed on said shank having one side facing toward said one end of said shank and adapted for sealing engagement with a punctured boat hull panel on the side thereof remote from the side on which said anchor arms are disposed, said one end of said shank being externally threaded from a point spaced from said anchor arms a distance somewhat greater than the width of said sealing disk forwardly toward said one end of said shank, said shank from said point rearwardly at least to a point adjacent the other end of said shank being reduced in diameter, a jamnut loosely slidably disposed on said diametrically reduced portion of said shank and threadedly engageable on said externally threaded portion thereof for urging said disk toward said anchor arms whereby the portions of said hull panel disposed about the punctured portion thereof may have said one side face of said disk disposed in frictional engagement therewith to seal said puncture, a thrust washer slidably disposed on said shank between said disk and said jamnut, said thrust washer being freely slidable on said diametrically reduced portion and including ratchet means lockingly and threadedly engageable with said threaded portion of said shank yieldingly resisting movement of said disk toward said anchor arms without rotation of said disk, preventing movement of said disk along said threaded portion away from said arms in the absence of rotation of said disk and effecting movement of said disk along said threaded portion away from said anchor arms upon rotation of said disk relative to said shank.

2. The combination of claim 1 including abutment means carried by said other end of said shank for preventing removal of said jamnut from said shank.

3. A boat hull patch assembly for making an emergency repair of a punctured boat hull panel, said patch assembly comprising an elongated support shank, a pair of anchor arms pivotally secured to one end of said shank for movement about axes extending transversely of said shank and of said anchor arms between generally radially outwardly extending positions and collapsed positions generally paralleling said shank and with the free ends thereof extending toward the other end of said shank, a centrally apertured large diameter sealing disk slidably disposed on said shank having one side facing toward said one end of said shank and adapted for sealing engagement with a punctured boat hull panel on the side thereof re-

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mote from the side on which said anchor arms are disposed, said one end of said shank being externally threaded from a point spaced from said anchor arms a distance somewhat greater than the width of said sealing disk forwardly toward said one end of said shank, said shank from said point rearwardly at least to a point adjacent the other end of said shank being reduced in diameter, a jamnut loosely slidably disposed on said diametrically reduced portion of said shank and threadedly engageable on said externally threaded portion thereof for urging said disk toward said anchor arms whereby the portions of said hull panel disposed about the punctured portion thereof may have said one side face of said disk disposed in frictional engagement therewith to seal said puncture, a thrust washer slidably disposed on said shank between said disk and said jamnut, said thrust washer being freely slidable on said diametrically reduced portion and including ratchet means lockingly and threadedly engageable with said threaded portion of said shank yieldingly resisting movement of said disk toward said anchor arms without rotation of said disk, preventing movement of said

disk along said threaded portion away from said arms in the absence of rotation of said disk and effecting movement of said disk along said threaded portion away from said anchor arms upon rotation of said disk relative to said shank, wherein said ratchet means includes at least one generally radially extending leaf spring secured along its outer end portion to the other side of said disk, the inner end of each of said leaf springs having a longitudinally opening arcuate recess formed therein for partially embracing said shank between adjacent threads formed thereon.

4. The combination of claim 3 wherein there are a pair of said leaf springs secured to said disk and disposed on opposite sides of the apertured portion thereof.

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