

June 30, 1964

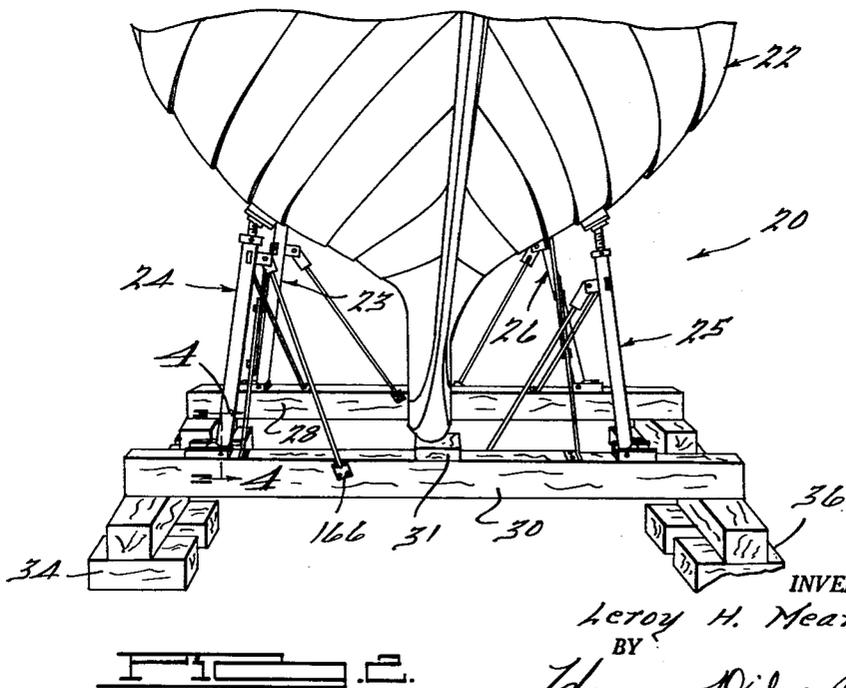
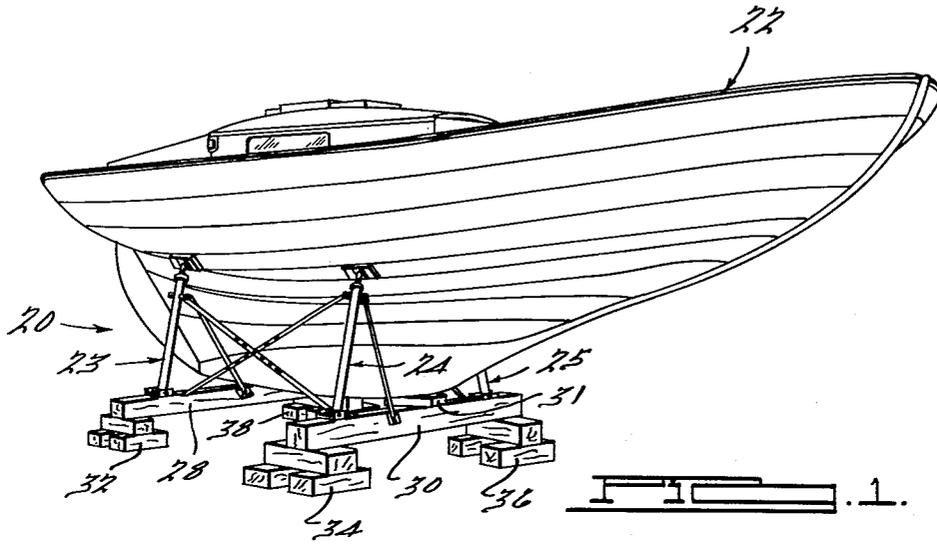
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BOAT STORAGE APPARATUS

Filed May 29, 1961

2 Sheets-Sheet 1



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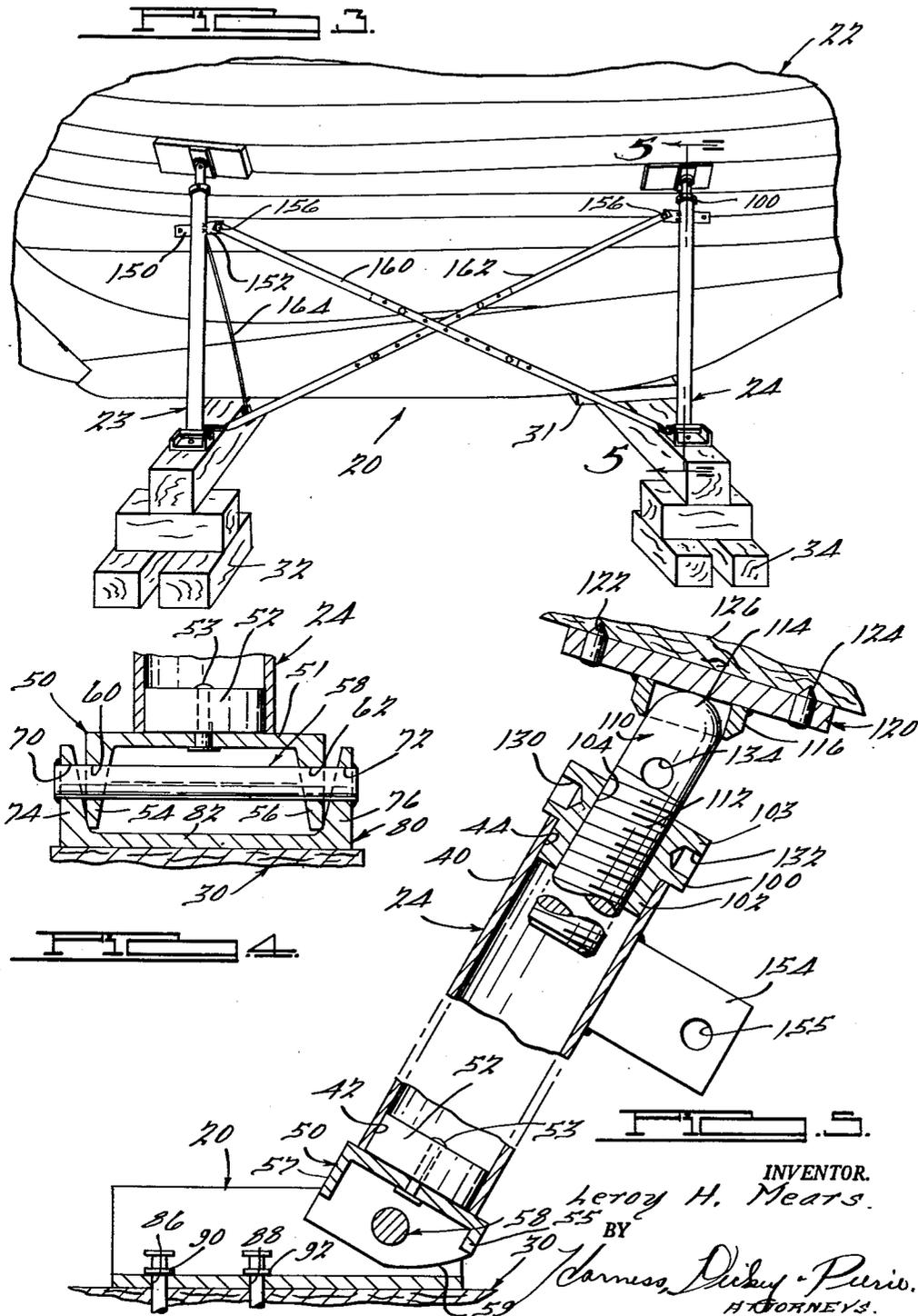
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BOAT STORAGE APPARATUS

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2 Sheets-Sheet 2



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**BOAT STORAGE APPARATUS**  
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 Filed May 29, 1961, Ser. No. 113,379  
 3 Claims. (Cl. 269—296)

This invention relates generally to marine storage facilities and more particularly to improved apparatus for supporting yachts and other relatively large boats in dry storage.

It has heretofore been the practice to support yachts and other comparably large boats that have been removed from the water, as for example for the purposes of winter storage, by building a supporting structure comprising a plurality of timbers and wedge blocks that are driven into supporting position against the hull of the boat so as to support the boat in an upright position. Such practices are cumbersome and time consuming and, in addition, often have a deleterious effect on the boat hull because of the difficulty of equalizing the supporting forces initially exerted on the hull and because of warpage, flexure and movement of the timbers and wedge blocks which may occur as a result of heaving of the earth due to frost and changes in temperature and humidity thereby changing the relationship of the support timbers and wedge blocks with respect to the other timbers and wedge blocks and with respect to the boat hull. As a result, an unbalanced and excessive localized stressing of the boat hull often occurs which is very difficult to correct and which may result in damage to the components of the boat hull.

Such prior boat supporting structures are also subject to the defect that it is very difficult to temporarily remove individual timbers and wedge blocks for the purpose of working on the hull in the area where such individual timbers and wedge blocks engage the hull. For example, it is often impossible to paint the entire bottom of the hull when prior boat supporting structures of the indicated character are utilized to support the hull with the result that marine railways or hoists utilized to launch the boats must often be immobilized for long periods of time while work is completed on the boat hull after it is removed from the boat supporting structure and before the boat can be launched.

An object of the present invention is to overcome disadvantages inherent in prior boat supporting structures of the indicated character and to provide improved apparatus for supporting boats in dry storage.

Another object of the invention is to provide improved boat supporting apparatus incorporating improved means facilitating the accommodation of boat hulls of various configurations.

Another object of the invention is to provide improved support apparatus for boats that may be easily and quickly assembled in supporting relationship with respect to a boat hull, and easily and quickly disassembled and removed therefrom for subsequent reuse.

Still another object of the invention is to provide improved boat support apparatus that may be adjusted relatively easily while in supporting relationship with respect to a boat to compensate for changes in hull configuration and other conditions that may occur while the boat is being supported thereby.

Another object of the invention is to provide improved boat supporting apparatus which reduces the overall cost of boat storage, maintenance and repair, and which facilitates working on the entire hull while the boat is in dry storage.

Other objects and advantages of the present invention will become apparent from the following description, the

appended claims and the accompanying drawings, wherein:

FIGURE 1 is a perspective view of a sailboat hull supported by apparatus embodying the present invention;

FIGURE 2 is an enlarged front view of the structure illustrated in FIGURE 1;

FIGURE 3 is an enlarged side-elevational view of the structure illustrated in FIGURE 1;

FIGURE 4 is an enlarged cross-sectional view taken substantially along the line 4—4 of FIGURE 2; and

FIGURE 5 is an enlarged cross-sectional view, with portions broken away, taken substantially along the line 5—5 of FIGURE 3 and with the tie rods removed therefrom.

In general, boat supporting apparatus constructed in accordance with the present invention comprises a plurality of extensible supports that may be pivotally secured, for example, to spaced, transverse beams underlying the boat hull. The extensible supports include adjustable head portions with angularly rotatable means thereon adapted to engage spaced portions of the boat hull, the head portions being angularly adjustable so that they may be oriented with respect to various hull contours so as to support the boat over relatively large areas. The extensible supports also include means facilitating bracing against transverse movement. Adjustment of the extensible support members may be effected relatively easily so as to accommodate changing conditions which may occur while the boat is being stored, as for example, because of warpage, shrinkage or expansion of the boat hull or other varying conditions, or because of variations in the supporting surfaces therefor which may be caused by frost or other changing conditions. The support apparatus may be relatively easily positioned with respect to a boat hull so as to effect a substantial saving in time, labor and material, thereby reducing the overall cost of boat storage, maintenance and repair.

Referring to the drawings, a preferred embodiment of the invention is illustrated therein and is comprised of boat support apparatus generally designated 20 which is shown in supporting relationship with respect to a sailboat hull 22. It will be understood, however, that the boat support apparatus has equal utility for the support of other types of boats, as for example, power cruisers.

The support apparatus 20 includes a plurality of extensible support members generally designated 23, 24, 25 and 26 which are secured to a pair of wooden beams 28 and 30 that extend transversely of and underlie the hull 22 so that the keel of the hull rests on the beams 28 and 30, suitable blocks such as 31 being inserted between the keel and the beams 28 and 30 so that the hull is positioned in a generally upright position and the keel is supported. The beams 28 and 30 are preferably elevated by suitable blocks 32, 34, 36 and 38 to facilitate positioning of a rail supported dolly or a trailer thereunder so that the boat may be readily moved thereby while being supported by the support apparatus of the present invention. Each of the extensible support members 23, 24, 25 and 26 is similar in construction, it being understood that any desired number of such support members may be utilized to support the boat depending upon the size and configuration of the hull.

As shown in FIGURE 5, each of the extensible support members 23, 24, 25 and 26 comprises a tubular member 40 which is preferably made of steel and which has open end portions 42 and 44. When boat support apparatus embodying the present invention is utilized in boat yards, marinas and like facilities, it is contemplated that tubular members 40 of various lengths will be provided to accommodate hulls of various sizes and configurations, relative adjustments in the lengths of the support members such as 23, 24, 25 and 26 being accom-

modated by an extensible feature hereinafter described in greater detail. The lower end portion 42 of the tubular member 40 is supported by a pivotal member 50 having an upwardly extending boss 52 that is secured to the member 50 as by a rivet 53 in the embodiment illustrated. The boss 52 is adapted to be inserted in the open end portion 42 of the member 40 to preclude lateral movement thereof with respect to the member 50. The member 50 is also preferably made of steel and, in the embodiment illustrated, includes a web portion 51 having downwardly depending flanges 54, 55, 56 and 57. The end portions of the flanges 54 and 56 are preferably rounded as at 59 so that the flanges 54 and 56 provide maximum resistance to bending, and at the same time rocking movement of the member 50 is permitted. A pivot pin 58 is provided which extends through complementary apertures 60 and 62 in the flanges 54 and 56 respectively, and through complementary apertures 70 and 72 in a pair of upwardly extending flanges 74 and 76 provided on a base plate 80. The base plate 80 is also preferably made of steel and may comprise a conventional structural channel that is relatively wider than the member 50 so as to accommodate the flange portions 54 and 56 of the member 50 between the flange portions 74 and 76 of the base plate. The base plate 80 is also provided with suitable apertures such as 86 and 88 for the acceptance of spikes 90 and 92 or other suitable fastening means which serve to anchor the base plate 80 to the associated transverse beam 28 or 30 underlying the boat hull 22.

An internally threaded member 100 is provided having a downwardly depending portion 102 that is adapted to be inserted in the upper end portion 44 of the member 40. The internally threaded member 100 also includes a collar portion 103 which bears against the adjacent end of the member 40. The member 100 is provided with an internally threaded bore 104 adapted to receive an externally threaded member 110 having an external thread 112 adapted to mate with the internal thread provided in the bore 104 of the member 100. Relative rotation between the externally threaded member 110 and the internally threaded member 100 effects axial movement of the member 110 with respect to the member 100 and the tubular member 40 so that the effective length of the support members 23, 24, 25 and 26 may be varied as desired within the range of axial movement of the member 110.

The head portion 114 of the member 110 is of hemispherical configuration in the embodiment of the invention illustrated and is adapted to be received in a generally cylindrical socket portion 116 of a top plate 120, the top plate 120 preferably being made of steel or other material having sufficient strength to withstand the forces exerted thereon. The top plate 120 is thus angularly rotatable with respect to the head portion 114 of the member 110 so as to be adjustable to the contour of the boat hull within the range of movement of the ball and socket configuration of the member 110 and the socket portion 116 of the top plate 120. The plate 120 is also preferably provided with a plurality of prongs 122 and 124 for positive engagement with a wooden cushioning block 126 that serves to increase the effective area of contact of each support member with the boat hull 22 so as to minimize unit stresses on the boat hull.

In the embodiment of the invention illustrated, the internally threaded member 100 is provided with a plurality of transverse bores 130 and 132 adapted to receive a rod or bar (not shown) and the externally threaded member 110 is also provided with a transverse bore 134 adapted to receive a rod or bar (not shown) so as to facilitate the manual application of torque to effect relative rotation between the member 110 and the member 100 to move the member 110 axially with respect to the member 100.

The tubular member 40 is provided with a plurality

of laterally extending flanges 150, 152 and 154, each preferably defining a bolt hole such as 155 to facilitate fastening suitable tie rods such as 160, 162 and 164 thereto as by bolts 156. The tie rods 160, 162 and 164 are preferably of split construction so as to be adjustable lengthwise to accommodate various spacings between the flanges 150, 152 and 154 and the beams 28 and 30. The end portions of the tie rods remote from the flanges 150, 152 and 154 are preferably enlarged and secured to the beams 28 and 30 with spikes 166 as shown in FIGURES 1, 2 and 3 so as to stabilize the support members 23, 24, 25 and 26 against transverse movement.

Installation of the support apparatus 20 under the hull 22 as as to support the hull in a generally upright position may be effected relatively easily and quickly and with a minimum of labor. The tubular members 40 are initially selected so that they are approximately of proper length to extend in a generally vertical but slightly inclined position between the transverse beams 28 or 30 and those portions of the boat hull to be supported, as shown in FIGURES 1, 2 and 3. The lower end portion of each selected member 40 is fitted over a boss 52 on its associated pivotal member 50. An internally threaded member 100 and an externally threaded member 110 are then assembled on the member 40 by fitting the depending portion 102 of the member 100 into the upper end portion 44 of the member 40. The base plates 80 are then secured to the associated beams 28 and 30 as by the spikes 90 and 92 and the cylindrical socket portion 116 of a top plate 120 is fitted over the head portion 114 of the associated member 110, a suitable block 126 being interposed between the top plate 120 and the boat hull as previously described. The top plate 120 and the block 126 are then biased into fine axial adjustment with respect to the hull 22 of the boat by rotating the member 110 relative to the member 100. Adjustment of the effective length of each of the support members 23, 24, 25 and 26 is thus rendered relatively easily since the members 110 and 100 are readily adjustable. The desired tie rods 160, 162 and 164 are then secured to the respective flanges 150, 152 and 154, the opposite ends of the tie rods remote from the flanges being secured to the beams 28 and 30 as shown in FIGURES 1, 2 and 3.

Since the apparatus 20 is normally exposed to the weather, the structural components thereof are preferably made from rust and corrosion resistant materials. For example, the member 100 may be made of corrosion resistant steel, and the member 110 may be made of Tobin bronze so that relative rotation of the members 100 and 110 may be effected under severe weather conditions. The remaining components of the support apparatus 20, with the exception of the wooden blocks 126, are preferably protected as by galvanizing or by applying a corrosion resistant protective coating.

It has been found that when a boat hull is supported with the apparatus 20 as above described, that an individual member 110 may be retracted axially relative to the associated member 100 and the top plate 120 and the associated block 126 removed therefrom without adversely affecting the vertical stability of the boat hull thereby enabling repair or maintenance of those portions of the hull normally covered by the block 126 when the block 126 is in boat supporting position. Thus, for example, by successively removing and replacing the top plates and blocks 126 of each of the support members 23, 24, 25 and 26, the entire boat hull may be painted while the boat hull is in dry storage thereby obviating the necessity of immobilizing a marine railway or hoist at the time the boat is launched.

While the preferred embodiment of the invention has been shown and described, it will be understood that various changes and modifications may be made without departing from the spirit of the invention.

What is claimed is:

1. Apparatus for supporting a boat in an upright position comprising, in combination, a plurality of elongated, longitudinally extensible supports extending between and engageable with the boat and an underlying surface, each of said supports including a base plate fixed to the underlying surface, a pivot plate, a pivot pin pivotally connecting said pivot plate to said base plate for pivotal movement about a generally horizontal axis, an elongated tubular member having smooth uninterrupted inner and outer surfaces throughout its entire extent and being open at both ends, all of said tubular members having the same inner and outer diameters and being of such lengths as to accommodate the boat hull, each member having one end portion releasably connected to said pivot plate by a telescoping connection so as to be movable therewith about said horizontal axis, a first threaded member releasably connected to the other end portion of said elongated tubular member by a telescoping connection and rotatable about a longitudinal axis thereof, said first threaded member having an internally threaded portion extending generally parallel to the longitudinal axis of said tubular member, a second externally threaded member threadably engaged with said first threaded member, and an upper support plate releasably carried by and angularly rotatable with respect to said second threaded member for the support of the boat, means for releasably carrying said upper support plate comprising a rounded end on said externally threaded member and a shallow socket on said upper support plate removably receiving said rounded end, whereby an individual externally threaded member may be retracted axially a short distance within said tubular member to permit lateral removal of said upper support plate.

2. Apparatus for supporting a boat in an upright position comprising, in combination, a plurality of elongated, longitudinally extensible supports extending between and engageable with the boat and an underlying surface, each of said supports including a base plate fixed to the underlying surface, a pivot plate, a pivot pin pivotally connecting said pivot plate to said base plate for pivotal movement about a generally horizontal axis, an elongated tubular member having smooth uninterrupted inner and outer surfaces throughout its entire extent and being open at both ends, all of said tubular members having the same inner and outer diameters and being of such lengths as to accommodate the boat hull, each member having one end portion releasably connected to said pivot plate by a telescoping connection so as to be movable therewith about said horizontal axis, an internally threaded member and rotatable about the longitudinal axis thereof, said internally threaded member having a threaded portion extending generally parallel to the longitudinal axis of said tubular member, an externally threaded member threadably engaged with said internally threaded member, an upper support plate releasably carried by and universally rotatable with respect to said externally threaded member for the support of the boat, means for releasably carrying said upper support plate comprising a rounded end on said externally threaded member and a shallow

socket on said upper support plate removably receiving said rounded end, whereby an individual externally threaded member may be retracted axially a short distance within said tubular member to permit lateral removal of said upper support plate, and a plurality of tie rods fixed to said extensible supports and to the underlying surface.

3. Apparatus for supporting a boat hull in an upright position comprising a plurality of elongated longitudinally extensible supports extending between and engageable with said hull and an underlying surface, each of said supports including an elongated tubular member open at each end, the inner and outer surfaces of all of said tubular members being unthreaded throughout their entire extent and having common inner and outer diameters, a pivot member having an upwardly extending boss releasably inserted in one end portion of each tubular member, said pivot member having a pair of depending flanges, a base plate having a pair of upwardly extending flanges adapted to receive said depending flanges in telescoping relationship, a pivot pin extending through said flanges and pivotally connecting said pivot member to said base plate for pivotal movement about a horizontal axis, means adapted to anchor said base plate to a surface underlying said hull, an internally threaded member having a depending portion releasably inserted in the other end portion of said tubular member and a collar portion bearing against the adjacent end of said tubular member, an externally threaded member threadably engaging said internally threaded member, means for effecting relative rotation between said internally threaded member and said externally threaded member, an upper support plate carried by and angularly rotatable with respect to said externally threaded member, means for carrying said upper support plate comprising a rounded end on said externally threaded member and a relatively shallow socket carried by said upper support plate and receiving said rounded end, whereby said externally threaded member may be retracted a relatively short distance within said tubular member to permit lateral removal of said support plate, a nonmetallic bearing plate fixed to said upper support plate and adapted to bear against said hull, said tubular member having a plurality of flanges extending laterally therefrom and at right angles to each other at a position near but spaced from said internally threaded member, and a plurality of tie rods, one end portion of each of said tie rods being fixed to one of said laterally projecting flanges and the other end portion being adapted to be anchored to a surface underlying said hull.

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