March 17, 1925. 1,529,897

E. J. LIST

STRUT

Filed June 16, 1924

FIG. 1.

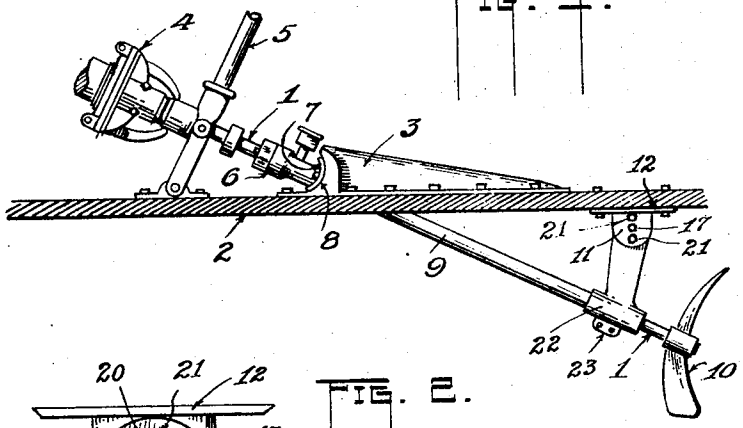


FIG. 2.

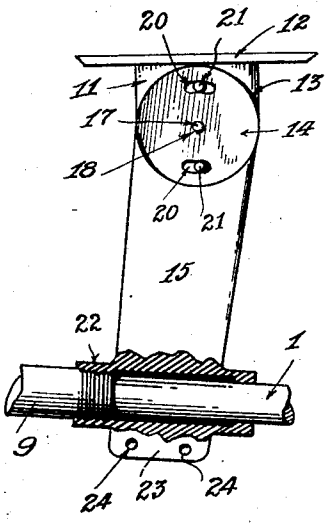


FIG. 3.

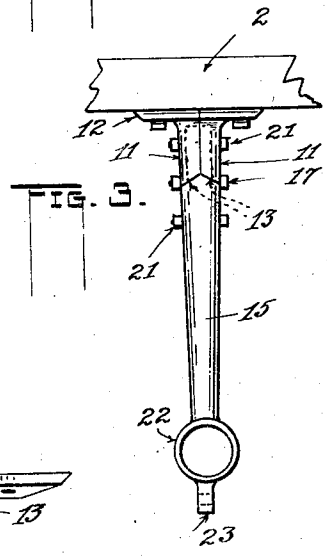


FIG. 4.

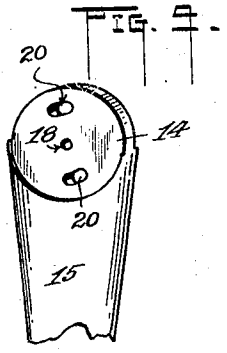
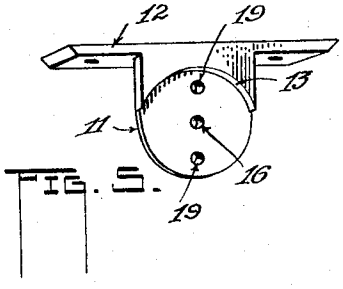


FIG. 5.



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UNITED STATES PATENT OFFICE.

EZRA J. LIST, OF HAVANA, ILLINOIS.

STRUT.

Application filed June 16, 1924. Serial No. 720,206.

To all whom it may concern:

Be it known that I, EZRA J. LIST, a citizen of the United States, residing at Havana, in the county of Mason and State of Illinois, have invented new and useful Improvements in Struts; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in struts. More particularly it pertains to a strut for supporting propeller shafts in power boats.

The main object of the invention is the provision of a strut for supporting the propeller-shaft in a power boat which shall have adjustability whereby its bore for said shaft can be exactly aligned with the latter.

A further object is to construct a strut of two main portions, one of them being adapted for attachment to the boat, the other portion being connected thereto and adjustable thereon and free to be aligned with the propeller shaft.

Still another object is to provide a strut of two connected main portions, one fixed and the other adjustable, and to include means for securing the portions relatively after adjustment.

Another object is to furnish a strut for the propeller shaft of a power boat wherein part thereof is adjustable upon and adapted to be secured relatively to a second fixed part and adapted to receive into it a shaft-housing assisting in securing the adjustable part in fixed position. But this will be made clear in the appended drawing which shows a preferred form of the invention though changes may be made therein as may be considered falling within the invention and within the scope of the appended claims.

Figure 1 is a side elevation of a propeller shaft and the strut forming the subject of this application, as applied to a boat.

Figure 2 is a side elevation of the strut on a larger scale, one of the parts having been removed to show features of construction.

Figure 3 is an elevation of the same as seen from either its front or rear.

Figure 4 illustrates in perspective a part of an adjustable portion of the strut, and

Figure 5 shows in perspective a portion of the strut adapted to be fixed in position upon the boat-bottom.

In Figure 1 has been illustrated a propeller shaft 1 which extends at an angle through the bottom of the boat 2, said shaft being carried through a shaft-log 3 within the boat and controlled by a clutch 4 and hand-lever 5. A bearing 6 for the shaft is formed with a cylindrically curved plate 7 which seats and rocks in a similarly curved seat 8 of the shaft-log 3, this construction permitting the shaft to be aligned at any desired angle, the latter, in effect, pivoting about the point from which the cylindrically curved surfaces of the parts are described. In addition, a pipe 9 forming a tubular housing for the shaft is carried at one end in the shaft-log in any suitable manner, not shown, the shaft 1 extending through it and receiving the propeller 10 at its projecting rear end.

No claim is made to the foregoing it having been described merely to make the drawing understood together with the use of the invention now to be described.

Secured to the bottom 2 of the boat above the shaft 1 just forward of the propeller 10 is the strut of the present invention. It includes a pair of depending brackets 11 (Figure 3), whose flanges 12 are bolted to the said bottom 2 in any approved manner. Said brackets are preferably duplicates, one of them being clearly shown in Figure 5. Each is recessed as at 13 permitting the flattened end 14 of an arm 15 to lie therein the assembled brackets enclosing said end 14 as shown in Figure 3. Centrally of each bracket is a hole 16 to receive a bolt 17 and centrally of the end 14 of the arm is a hole 18, the bolt passing through all three serving as a pivot about which the arm may rock. At diametrically opposite sides of the holes 16 of the brackets are holes 19 and registering therewith in the end 14 are slots 20. Bolts 21 extending through the parts serve to clamp them firmly, it being clear that the arm 15 may be free to swing about the center bolt 17 within the limit of the slots when said bolts 21 are loosened.

The lower end of the arm is provided with a hub 22 having a bore whose axis may lie at right angles to the longitudinal line of the arm (Figure 2), or at any other angle as, for example, as shown in Figure 1. Said hub may be an integral part of the arm, as in this instance, and at that end of its bore farthest from the propeller may be threaded to receive the threaded end of the

pipe or tube 9. The other end of the bore or that nearest the propeller may form a bearing for the shaft 1, or a separate bearing, not shown, may be inserted for the same purpose if desired. Below the hub is an extension 23 provided with holes 24 for attachment of a shoe, skeg or rudder if desired.

The work of attaching a rigid strut to a boat is a difficult one and one requiring great care and considerable time since it is required, of course, that its bearing for the propeller shaft must be in perfect alignment with said shaft so that undue wear shall not result. This necessitates wedging and shimming such a strut very carefully before the securing bolts are tightened and even then the final results are not satisfactory. However, in applying the adjustable strut herein described it is only necessary to slip the hub 22 upon and shift it along the shaft, should the latter be already in place, until the brackets reach a firm seating upon the bottom 2, the bolts 17 and 21 being left loose, of course, during this act. As may be understood, the parts are practically self-adjusting and after tightening the bolts that secure the brackets in place the bolts 17 and 21 can be tightened and the work is finished. If at any time the angle of the shaft is to be changed for any reason the loosening of the last named bolts easily admit of such change whereupon they may be again tightened. If the strut is first attached to the boat followed by the installation of the shaft and its parts said shaft may be slipped into the hub, the latter readily and naturally taking up the angle at which the shaft is set. The tube or pipe 9, which is used to protect the shaft, is screwed into the shaft log and this tube or pipe, when threaded at its rear end, can be screwed into the hub 22 acting to brace the strut and serve as a holding means in addition to the bolts 17 and 21.

As already intimated, the strut may be altered in its construction while still giving the advantages named herein since it is not the intention to be confined to the exact form of parts shown.

What is claimed as new is:

1. In combination with a boat and its propeller-shaft, a strut spaced rearward from that part of said shaft where is extends through the boat-bottom and disposed adjacent the propeller comprising a part secured to the under side of the boat between the latter and said propeller-shaft, and a second part pivotally attached at one end to the first part between the same and the shaft and including a bore at its other end to receive the said shaft, and means to fix the said second part with respect to the first in adjusted positions.

2. In combination with a boat and its propeller-shaft, a strut spaced rearward from that part of said shaft where it extends through the boat-bottom and disposed adjacent the propeller comprising a part extending from the under side of the boat between the latter and said propeller-shaft and rigidly secured to said boat, and a second part pivoted to the first between the same and the shaft, depending from the said first part and having an angularly arranged bore to receive the said shaft, and means extending through the parts adapted for fixing the second part in rigid adjusted relation after the said bore has been aligned with said propeller with respect to the first shaft.

3. In combination with a boat and its propeller-shaft, a strut spaced rearward from that part of said shaft where it extends through the boat-bottom and disposed adjacent the propeller for supporting the free end of said shaft comprising a part depending from and secured rigidly to the boat between the same and the shaft, a second part pivotally suspended from the first part between it and the boat and having a bore to receive into it the said shaft, and means extending through the parts spaced from the pivot thereof for securing said parts in rigid relation when the parts have been placed in position and the axis of the bore has been aligned with the said propeller-shaft.

4. In combination with a boat and its propeller-shaft, a strut spaced rearward from that part of said shaft where it extends through the boat-bottom and disposed adjacent the propeller for supporting the free end of the shaft and the propeller comprising a part depending from and secured rigidly to the boat between it and the shaft, a second part pivotally suspended from the first part and having a bore to receive into it the said shaft, and means extending through the parts spaced from the pivot thereof in substantially diametrically opposite positions for securing said parts in rigid relation when the parts have been placed in position with the axis of the bore in alignment with that of the propeller-shaft.

5. In combination with a boat and its propeller-shaft, and a tubular housing for the latter secured at one end in the boat, a strut comprising a part depending from and secured rigidly to the boat, a second part pivotally suspended from the first part and having a bore to receive the shaft through which the said shaft is adapted to extend, said second part also having one end of the housing secured thereto bracing the same.

6. In combination with a boat, its propeller-shaft, and a tubular housing for the latter secured at one end in the boat, a strut comprising a part depending from and secured rigidly to the boat, a second part pivotally suspended from the first part adapted

to swing in a single given plane and having a bore to receive the shaft and through which the latter extends, said bore being adapted for receiving the outer end of said housing.

7. In combination with a boat, its propeller-shaft, and a tubular housing for the latter secured at one end in the boat, and threaded at its other end, a strut comprising a part depending from and secured rigidly to the boat, a second part pivotally suspended from the first and having a bore to receive into it the said shaft, said bore being also partially threaded, and adapted to receive the threaded end of said housing.

8. In combination with a boat, its propeller-shaft, and a tubular housing for the latter fixed at one end in the boat, a strut affixed to the bottom of the boat and depending therefrom comprising two portions one pivotally suspended from the other, means to secure the parts in fixed relation, the suspended portion having a bore to receive the shaft and also having the free end of the housing affixed thereto.

9. In combination with a boat and its propeller shaft, a strut comprising a part depending from and secured to the bottom of the boat, being between that latter and said propeller-shaft, a second part pivotally suspended therefrom at a point between the boat and shaft adapted to swing in a single given direction and having a bore to receive the said shaft, and means secured at one end to the boat, extending at an angle forwardly and attached at its rear end to the said second part.

10. A strut for the purpose described comprising a part made up of two companion members for attachment to a boat, each having a depending portion having a clamping face, a second part having a portion to lie between the depending portions, there being an arcuate slot in said portion of said second part, a bolt extending through said slot and the said depending portions of the first named part for clamping the whole together, the said second part having a bore therein to receive a propeller-shaft.

In testimony whereof I affix my signature in presence of two witnesses.

EZRA J. LIST.

Witnesses:
ADELINE D. BERRY,
OREN E. LIST.