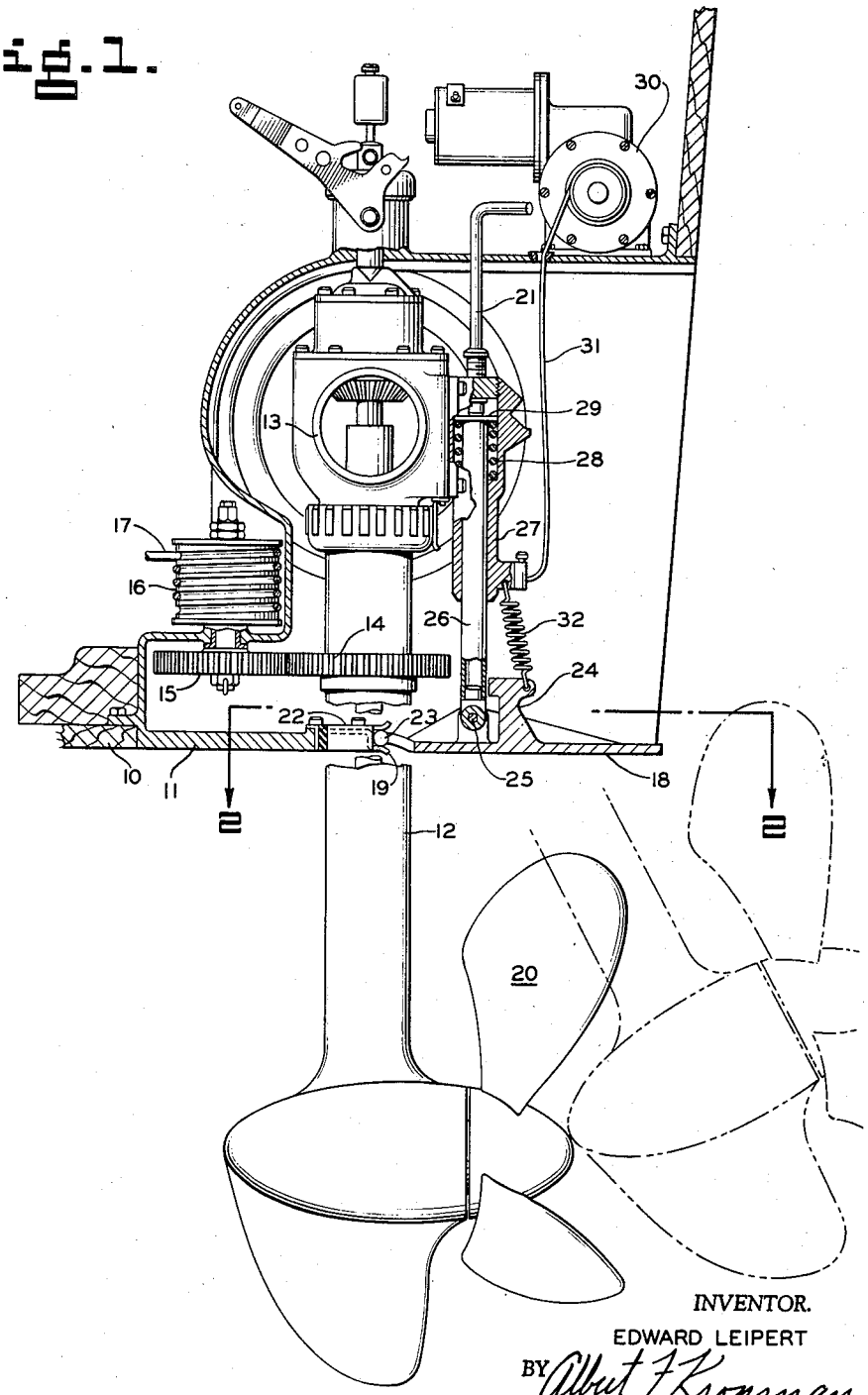
Nov. 17, 1959 E. LEIPERT 2,912,955

COMBINED CAVITATION PLATE AND TRIM TAB ASSEMBLY

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Fig. 1.



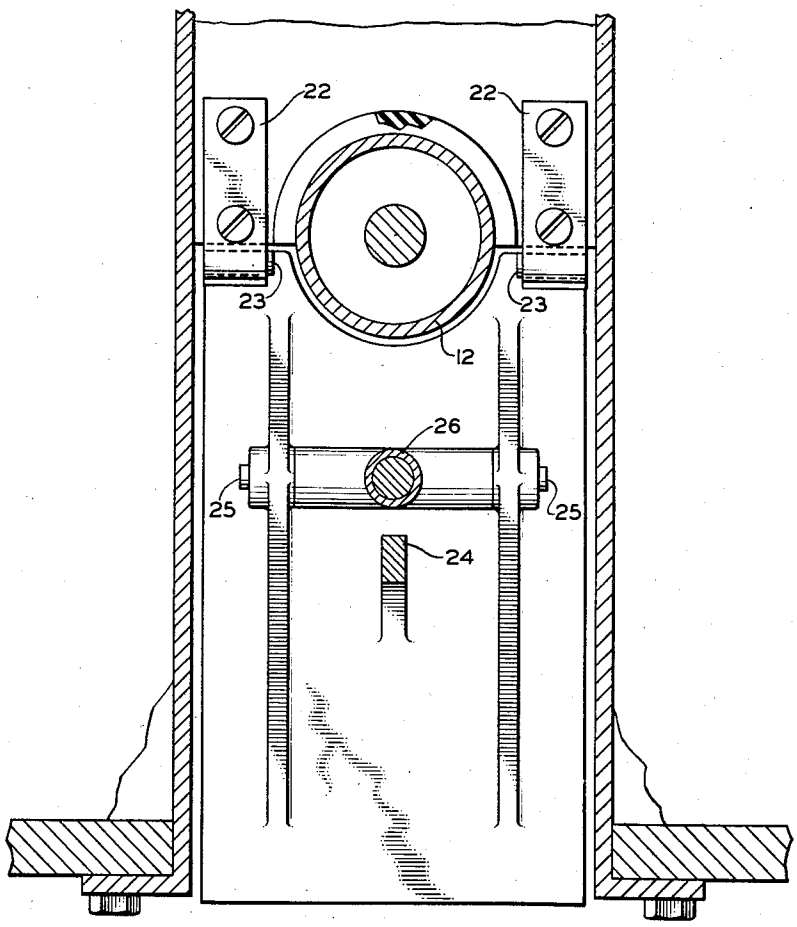
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Fig. 2.



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COMBINED CAVITATION PLATE AND TRIM TAB ASSEMBLY

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9 Claims. (Cl. 115—41)

This invention relates to marine propulsion devices and more specifically to an adjustable anti-cavitation plate, which may function as a trim tab.

In marine propulsion devices such as outboard motors it is customary to provide a plate above the propeller to overlie the said propeller for the purpose of reducing cavitation. The use of such plates appears to increase the efficiency during the running operation of the propulsion device. In marine propulsion devices in which the propeller is disposed beneath the bottom of the boat the bottom of the boat itself acts to prevent cavitation.

In the presently known outboard motor drive devices the anti-cavitation plate is tiltable but only in conjunction with the entire propeller drive housing. As a result, when the cavitation plate is swung into a position which might be more advantageous from the standpoint of the riding qualities of the boat the propeller of the drive mechanism will be changed to a position which is less desirable for achieving the full forward thrust of the propulsion device.

Accordingly, it is an object of the present invention to provide an anti-cavitation plate which is tiltable in a fore and aft plane in order to provide more favorable conditions, such as planing of the vessel.

Another object of the present invention is to provide a tiltable anti-cavitation plate which will function as a trim tab as the vessel is passing through the water.

A further object of the present invention is to provide an anti-cavitation plate which may be tilted to any desired position without moving the propeller and its housing.

A further object of the present invention is to provide an anti-cavitation plate which will not impede the action of the propeller and its housing in swinging upwardly upon encountering a submerged object.

A still further object of the present invention is to provide an anti-cavitation plate which may be regulated as to its disposition with respect to the hull from within the boat.

A feature of the present invention is its use of a hinged plate disposed above the propeller of the marine propulsion device.

A further feature of the present invention is its control means for regulating the disposition of the anti-cavitation plate.

Another feature of the present invention is its quick-disconnect means for release of the anti-cavitation plate in the event that the propulsion device strikes a submerged object.

The invention consists of the construction, combination and arrangement of parts, as herein illustrated, described and claimed.

In the accompanying drawings, forming a part hereof, is illustrated one form of embodiment of the invention, and in which:

Figure 1 is a view in longitudinal section taken through a marine propulsion device, with certain portions shown in side elevation, showing a complete embodiment of the present invention.

Figure 2 is a horizontal section taken on line 2—2 in Figure 1, looking in the direction of the arrows.

Referring to the drawings, and specifically to Figure 1, 10 indicates the bottom of a boat or vessel having a main housing 11 secured within a cutaway portion at the stern thereof. The main housing 11 has supported therein a swingable and steerable drive section 12. The drive section 12 is supported, trunnion fashion, within the main housing 11 at bearing points 13. The drive section 12 is steered through gears 14 and 15 which are connected to the drive section 12 and a pulley 16, respectively. The pulley 16 may be controlled by means of a cable 17 or similar device. An anti-cavitation plate 18, hereinafter referred to as the trim tab is secured to the main housing 11 by means of a resilient hinged-like arrangement 19. The trim tab is disposed above the propeller 20 and may be controlled from within the boat by means of the adjusting handle 21 which is removed after a satisfactory adjustment has been made. The hinge-like member 19 consists of spaced plates 22 secured at one end to the main housing 11 and adapted to embrace the fulcrum pins 23 formed on the inboard end of the trim tab 18. The spaced plates 22 are resilient and permit the fulcrum pin to be withdrawn therefrom without damage to the said plates. As shown in Figure 2, it is preferred to have spaced plates on either side of the drive section 12 and a fulcrum pin 23 for each of said spaced hinge plates. The trim tab 18 is provided with a stop member 24 which limits the counterclockwise or upward rotation of the trim tab to a desired degree.

The trim tab 18 is also formed with a pivot point 25 to which there is attached a vertical support and adjusting member 26. The vertical support member 26 may be tubular as shown in Figure 1 and partly carried within the housing 27. The housing 27 is rigidly secured to the drive section 12 and the vertical support is slidably received therein.

A retractor spring 28 is carried within the housing 27 and bears against the underside of a shoulder 29 formed on the top of the vertical support member 26. The adjustable handle 21 is received through the housing 27 by means of a threaded member 21a which bears against the top of the shoulder 29. By turning the adjusting handle up and down within the housing 27, movement of the support member 26 is obtained so that the cavitation plate can be caused to rotate about the hinged structure 19 to vary the angle of incidence or attack of the said cavitation plate or trim tab upon the water.

When the lower portion of the drive section 12 strikes an underwater object the entire drive section will swing upwardly to prevent harm to the mechanism. As the drive section 12 swings it will pull the trim tab 18 out of engagement with the spaced resilient hinge plates 22 thereby freeing the said trim tab from the main housing 11. The trim tab will therefore not interfere with the swinging safety feature of the drive device nor will it prevent operation of beaching the vessel. Also since the trim tab is not connected with the lower steerable portion of the drive unit 12 it is not affected by steering of the boat.

When it is again desired to operate the vessel the drive section 12 can be swung downwardly into the position shown in Figure 1, whereupon the trim tab 18 will be brought into engagement with the spaced plates 22.

Because of the inboard accessibility of the trim tab adjusting handle 21 the trim tab can be given the most desirable position while the boat is under way. In this manner, planing efficiency of the hull can be brought to

its maximum without disturbing the operation of the propeller and while the boat is in motion.

If it is desired to raise the entire marine propulsion device for the purpose of beaching or the like, a small winch 30 or other suitable lifting device may be located on top of the main housing 11 and a cable 31 attached thereto having its free end connected to the housing 27.

When the trim tab 18 is released from the hinged structure 19, a small coil spring 32, connected to the stop 24 at one end and the housing at its opposite end will bring the trim tab into contact with the vertical support member 26 and cause the stop to bear against said member to prevent further rotation of the trim tab 18.

From the foregoing it will be seen that there has been provided a combined anti-cavitation plate and trim tab for a marine propulsion device which is compatible with a rearwardly swingable and steerable drive section and which may be adjusted to maximum efficiency from within the boat while the said vessel is under way.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States, is:

1. An adjustable anti-cavitation plate assembly for marine propulsion devices comprising, in combination, a fixed housing for attachment to the hull of a boat, a swingable propeller drive housing pivotally mounted at its upper end within the fixed housing, a plate member supported by the drive housing, a quick release, hinge-like, coupling between the inboard end of the plate and the fixed housing and means to rotate the plate about its coupling to adjust its position with respect to the boat.

2. An adjustable anti-cavitation plate assembly for marine propulsion devices comprising, in combination, a fixed housing for attachment to the hull of a boat, a swing able propeller drive housing pivotally mounted at its upper end within the fixed housing, a plate member, an elongated vertical member pivotally secured at its lower end to the plate and supported by the drive housing, a quick release, hinge-like, coupling between the inboard end of the plate and the fixed housing and means including the vertical member to rotate the plate about its coupling to adjust its position with respect to the boat.

3. An adjustable anti-cavitation plate assembly for marine propulsion devices comprising, in combination, a fixed housing for attachment to the hull of a boat, a swingable propeller drive housing pivotally mounted at its upper end within the fixed housing, a plate member, an elongated vertical member pivotally secured at its lower end to the plate, a guide housing about the vertical member and supported by the drive housing, a quick release, hinge-like, coupling between the inboard end of the plate and the fixed housing and means including the vertical member and a rod extending into the said guide housing to rotate the plate about its coupling to adjust its position with respect to the boat.

4. An adjustable anti-cavitation plate assembly for marine propulsion devices comprising, in combination, a fixed housing for attachment to the hull of a boat, a swingable propeller drive housing pivotally mounted at its upper end within the fixed housing, a plate member supported by the drive housing, a quick release, hinge-like, coupling between the inboard end of the plate and the fixed housing consisting of spaced resilient members carried by the fixed housing and a fulcrum pin on the plate receivable within the said spaced members, and means to rotate the plate about its coupling to adjust its position with respect to the boat.

5. An adjustable anti-cavitation plate assembly for marine propulsion devices comprising, in combination, a fixed housing for attachment to the hull of a boat, a swingable propeller drive housing pivotally mounted at its upper end within the fixed housing, a plate member supported by the drive housing, a quick release, hinge-like, coupling between the inboard end of the plate and the fixed housing consisting of at least two pairs of spaced resilient members carried by the fixed housing and a fulcrum pin on the plate receivable within each of the pairs of said spaced members, and means to rotate the plate about its coupling to adjust its position with respect to the boat.

6. An adjustable anti-cavitation plate assembly for marine propulsion devices comprising, in combination, a fixed housing for attachment to the hull of a boat, a swingable propeller drive housing pivotally mounted at its upper end within the fixed housing, a plate member, an elongated vertical member pivotally secured at its lower end to the plate and supported by the drive housing, a quick release, hinge-like, coupling between the inboard end of the plate and the fixed housing, a rotation limiting stop between the plate and vertical member and means, including the vertical member to rotate the plate about its coupling to adjust its position with respect to the boat.

7. An adjustable anti-cavitation plate assembly according to claim 5 in which the pairs of resilient members are disposed on opposite sides of the drive housing and the plate is cut away to receive the said housing therethrough.

8. An adjustable anti-cavitation plate assembly according to claim 3 in which the rod is threadably received within the top of the guide housing and bears against the top of the vertical member.

9. An adjustable anti-cavitation plate assembly for marine propulsion devices comprising, in combination, a fixed housing for attachment to the hull of a boat, a swingable propeller drive housing pivotally mounted at its upper end within the fixed housing, a plate member, an elongated vertical member pivotally secured at its lower end to the plate, a guide housing about the vertical member and supported by the drive housing, a quick release, hinge-like, coupling between the inboard end of the plate and the fixed housing consisting of at least two pairs of spaced resilient members carried by the fixed housing and a fulcrum pin on the plate receivable within each of the pairs of said spaced members and means including the vertical member and a rod extending into the said guide housing to rotate the plate about its coupling to adjust its position with respect to the boat.

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