

Dec. 15, 1959

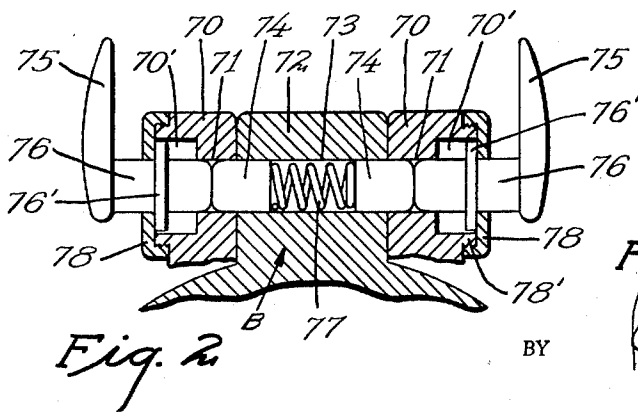
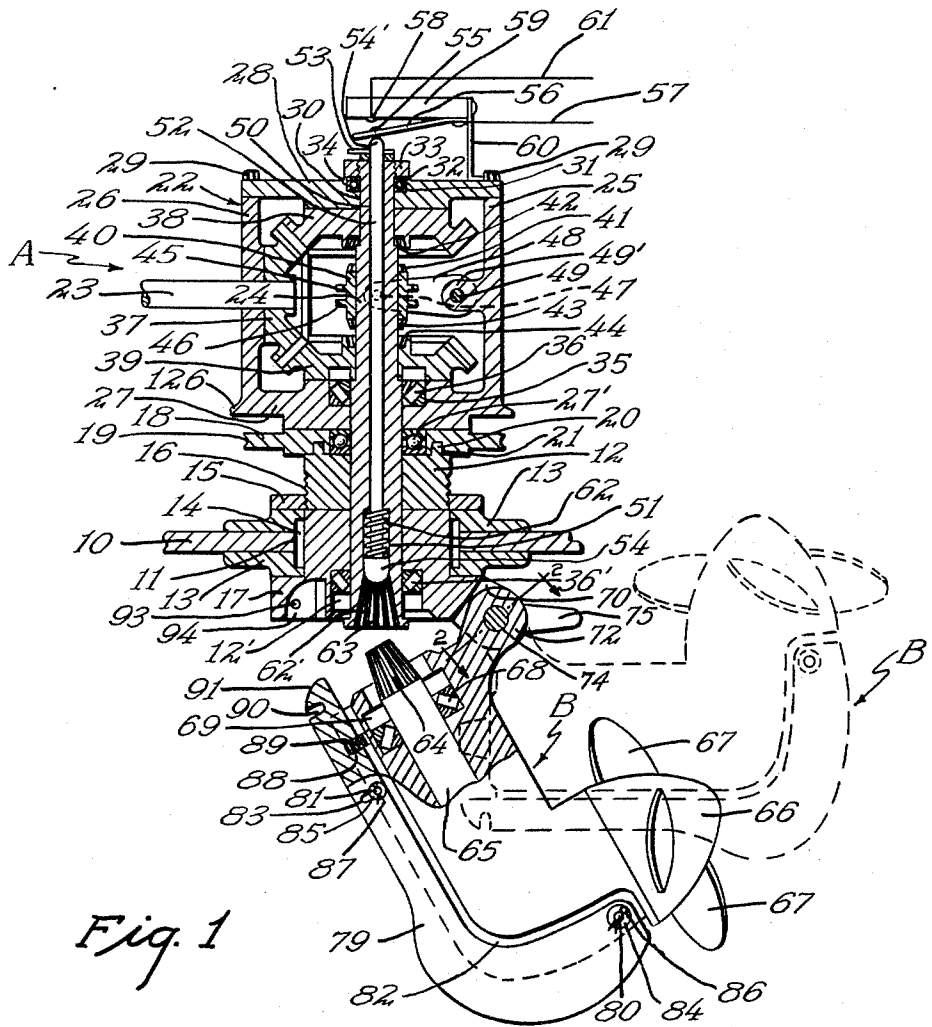
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2,917,019

PROPELLER HOUSING ATTACHMENTS

Filed Feb. 16, 1955

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

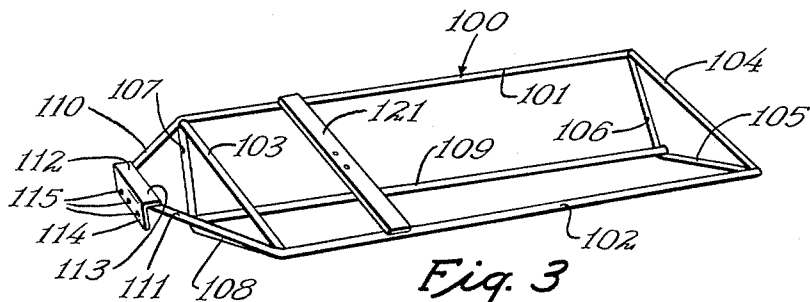


Fig. 3

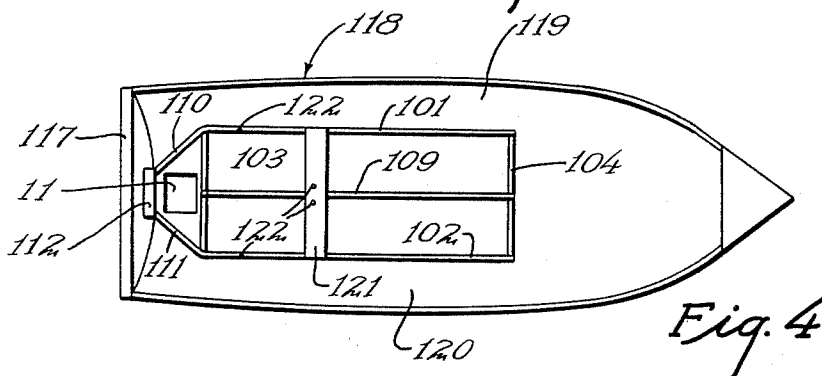


Fig. 4

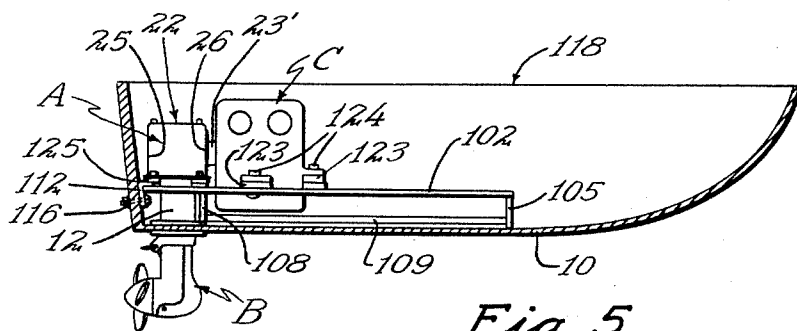


Fig. 5

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PROPELLER HOUSING ATTACHMENTS

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8 Claims. (Cl. 115—35)

This invention relates to the provision of an improved insertable motor mounting structure for a boat in combination with the protection of a motor boat propeller and its operating mechanism. More particularly the invention is concerned with an improved insertable reinforcing structure for a motor mounting and the protection, removal and replacement of a boat propeller in combination with an automatic ignition cut-off when the propeller housing and its associated drive shaft are disengaged from the main drive shaft housing and its associated drive shaft.

In the operation of outboard motor craft using a propeller drive there is usually provided at some point of the drive a shear pin or key which is automatically broken when the propeller hits a snag or is stopped suddenly by some obstructing force. This shear pin must be replaced by dismantling the structure and replacing the broken shear pin. This dismantling of a simple outboard motor is usually not difficult, if tools are available, as the motor can be dismounted or the propeller tipped out of the water within reach of the hands. However with larger permanently installed motors, where the propeller housing and its associated drive are a permanent attachment, the replacement of a shear pin or repair of a damaged propeller is more difficult and usually requires beaching of the craft for necessary repairs.

Accordingly it is an object of this invention to provide an improved detachable propeller gear housing attachment to a permanently installed drive shaft housing.

Another object of this improvement in protecting the driven propeller from damage by obstructions is to provide an automatic stoppage of the propeller upon a first contact of the housing with the obstruction.

An additional object of this improvement in protecting structure for motor boat propellers is the provision of a control of the ignition circuit upon separation of the propeller gear housing from a motor driven shaft housing.

Another object of this improvement in protecting the driving mechanism of an outboard and other propeller driven water craft is the provision of an insertable motor boat frame mounting which supports the propeller and its driving mechanism and reinforces the bottom of the boat against the weight of the propeller housing in combination with its associated drive mechanism.

Another object is to provide an improved new combination of structure for protecting an underwater propeller from damage by unseen obstructions.

Further objects and advantages will be apparent from the following description of the accompanying drawings, wherein:

Fig. 1 is a partial sectional view showing an arrangement of structure embodied in this disclosure;

Fig. 2 is a partial sectional view of the detachable pivotal mounting for the propeller and its associated housing and gearing, the position of the section being indicated by the line 2—2 of Figure 1;

Fig. 3 is a perspective of the motor boat frame mounting for supporting the propeller and its associated driving mechanism;

Fig. 4 is a top plan view of a boat structure showing

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the mounting illustrated in Fig. 3 positioned therein, and Fig. 5 is a side plan view of a boat structure with a side and bottom portion removed and illustrating the frame mounting supporting the propeller and its associated driving mechanism.

In the drawings the permanently attached main drive gearing and shaft housing are designated by the letter A and the propeller and separable gear housing pivotally detachable from the main shaft housing are designated by the letter B.

In the structure illustrative of my new and useful improvement, a boat bottom 10 is provided with an aperture 11 through which an intermediate drive shaft housing 12 is mounted. A pair of steering guide plates 13 are mounted about the shaft housing 12 on each side of the aperture 11. The area 14 between the plates 13 is filled with a water sealing packing. A locking collar 15 turned down on threads 16 binds the guide plates between the lower flange 17 of housing 12 and collar 15 and solidly against both sides of the boat bottom 10.

Mounted on the shaft housing 12 is a steering sprocket or sleeve 18 provided for example with a guide wire groove 19 about the peripheral edge of the steering sleeve 18. A pair of integral pins 20, on housing 12, fit within holding slots or grooves 21 in the steering sleeve 18, so that the shaft housing 12 with the propeller and its associated housing B can be turned 360°.

Above the steering sleeve 18 is mounted a stationary gear housing 22 containing gearing connecting the motor driven shaft 23 with an intermediate propeller driving shaft 24.

The housing 22 is an enclosure provided with the usual side walls as illustrated by 25 and 26, a bottom wall 27, supported on a roller bearing mounting 27', and detachable top plate or wall 28. The top is fastened down by screw bolts 29 and is provided with an aperture 30 through which shaft 24 extends. The depression 31 in top 28 seats a roller bearing ring 32 upon which retaining nut 33, for shaft 24, rests in sliding relationship with lip 34 extending about the depression 31. The base or bottom wall 27 of housing 22 is provided with a depression 35 within which is seated another bearing ring 36. A water seal and roller bearing 36' seated within depression 12', supports the lower end of shaft 24.

The drive shaft 23 is keyed to a gear 37 which rotates with a top gear 38 and bottom gear 39 freely rotatable on the shaft 24. Mounted on the shaft 24 and rotatable therewith is a clutch 40 provided at one end with gear teeth 41 for meshing with gear teeth 42 in gear 38 and at the other end with gear teeth 43 for meshing with gear teeth 44 in gear 39. A pair of integral, or otherwise attached spaced plates 45 and 46 extend from the clutch 40 and serve to form riders or a mounting for pin 47 on rocker arm 48, whereby through movement of pin 49, supported by lug 49' on wall 27, operated by a suitable shifting lever (not shown) the sliding gear 41 is shifted to intermesh with either top gear 38 or bottom gear 39, for rotating intermediate shaft 24 from shaft 23, as desired.

The intermediate drive shaft 24 is provided with a central aperture 50 with an enlargement 51 in the lower end of the shaft 24. Secured within the aperture 50 and 51 is a push rod 52 held by pin 53 and having at one end an enlarged head 54 which fits and moves within the aperture portion 51 and at its opposite end a tip 54' which bears against a make and break circuit contact 55 mounted on spring arm 56 connected by conductor 57 through the ignition circuit (not shown). Another contact 58 is mounted upon the arm 59 of standard 60 and also connected by conductor 61 through the ignition circuit. A hand switch, not shown, may be used for bypassing the conductors 57 and 61 when it is desired to run

the motor without the propeller housing being attached. Otherwise a spring 62 mounted about shaft 52, within aperture portion 51, bears against the base of the enlarged aperture 51 and head 54 to withdraw tip 54' from forcing contact 55 against contact 58 and cut out the ignition circuit whenever the propeller is disconnected, in the manner as hereinafter described.

The hollow lower or base end 62' of the intermediate drive shaft 24 is provided with a plurality of grooves 63 within which the splines or keys 64 of drive shaft 65, extending from the impeller gear housing B, are fitted to turn propeller 66 and relative driving blades 67. A water seal and roller bearing 68 is mounted about shaft 65 in cavity 69 of housing B. The connection of shaft 65 to propeller 66 (not shown) is of the conventional pinion and gear type, and may or may not use the conventional shear pin arrangement for protecting the blades 67.

The detachable fastening of the housing B to drive shaft housing 12 is more clearly illustrated in Figure 2 taken in conjunction with Figure 1 in that the spaced pair of lugs 70 (only one of which is shown) are sloping outwardly and downwardly and provided with aperture 71. The housing B is also provided with an upwardly and outwardly extending lug 72 having aperture 73. Fitted in the aperture 73 is a pair of movable pins 74 which are mounted to ride against pins 76 on a pair of handles 75. The spring 77 serves as a spring load to normally keep the pins 74 thrust apart or in locking and pivotal fitting engagement within the apertures 71 of lugs 70. The ends of spring 77 may be spot welded to the base of pins 74 to retain them in aperture 73. By squeezing the handles 75 together the pins 74 are forced from apertures 71 against the compression of spring 77. In order to secure the pins 76 to lugs 70, the lugs 70 are provided at their sides with depressions 70' which are of sufficient depth to permit collars or keys 76' to move with pins 76 inwardly when depressing pins 74. The keys 76' extend through suitable apertures in pins 76 and collars 78 are threaded upon the threaded shoulders 78' to retain handle 75 in cooperative working relationship with pins 74 and associated with lugs 70. The pins 74 being slidably insertable in apertures 71 pivotally engage the propeller housing B to the stationary intermediate shaft housing 12. In Figure 1, the housing B is illustrated in a displaced position by the letter B' however it is to be understood that its actual center of gravity or weight normally aligns the shaft 65 into interlocking engagement with shaft 24, as hereinafter described.

The mechanism provided for protecting the propeller 66, blades 67 and housing B from breakage by impact with an underwater obstruction is a pivotal lever arm 79 attached to the forward end of the housing B by pins 80 and 81 formed, for example, as integral portions of the housing B extending at right angles from the flange portion 82 which projects as an extension from the housing B. The lever arm 79 is provided with a suitable pivotal aperture in the end thereof (not shown) which permits arm 82 to slide over pin 80 for rotational movement therewith and a slotted aperture 83 through which pin 81 projects and cooperatively limits the rotational movement of arm 79 on pin 80. The pins 80 and 81 are provided with conventional cotter key apertures whereby the holding washers 84 and 85 are held by cotter keys 86 and 87, respectively, to hold the lever arm 79 in operative position. The upper end of lever arm 79 is provided with a depression 88 within which is seated the one end of a compression spring 89 with its opposite end resting against the wall of housing B. A catch or locking slot 90 is provided just below the upper rounded end 91 of arm 79. This rounded end 91 is adapted to ride against the integral projection or catch pin 93 in depression 94 of flange 17, and move arm 79 back against the thrusting force of compression spring 89 until slot 90 engages pin 93 and splines 64 are engaged in grooves 63. Then the spring 89 forces arm 79 forward to lock the pin 93 in slot 90

and thereby hold the shaft 65 in locked engagement with the intermediate drive shaft 24. In addition the end of shaft 65 engages against tip 54, lifting push rod 52 and tip 54' thereby closing contacts 55 and 58 in the ignition circuit.

Upon any movement of the boat by the turning of propeller blades 67, on contact of the lever arm 79 with an underwater obstruction, the pressure of the object bearing against lever arm 79 causes the arm to be pivoted against the compressive force of spring 89 and unlatches slot 90 from pin 93 permitting the propeller housing B to rotate upwardly on pivot pins 74 to clear the obstruction. Simultaneously the ignition circuit is broken by separation of the contacts 55 and 58. Thereafter the housing B swings back, or otherwise may be pulled or pushed back, to engage the pin 93 in slot 90, mesh the drive shafts 24 and 65, and close contacts 55 and 58 before the motor C is again started.

In order to securely mount and support the housing 12 through aperture 11 and associated gear housing A, motor C, and removable propeller housing B, without damage to the boat bottom 10, a mounting frame 100 is provided. This frame 100, as shown in Figure 3, is formed of a pair of parallel metal bars 101 and 102 welded together at the ends with cross bars 103 and 104. The preferred length of the bars 101 and 102 is at least or slightly more than $\frac{1}{2}$ of the length of the boat and the cross bars are selected of an exact length so that the rectangular framework described fits snugly against the inner sides of a boat when supported by the downwardly and inwardly sloping brace rods 105, 106, 107 and 108 which meet at an angle below the center of end cross bars 103 and 104 and at the center line of the boat. The brace 105 is welded to the rectangular frame at the juncture of bars 102 and 104. The brace 106 is welded to the rectangular frame at the juncture of bars 104 and 101; brace 107 at the juncture of bars 101 and 103, and brace 108 at the juncture of bars 103 and 102. A lower center brace rod or bar 109 is welded at its one end at the juncture of braces 105 and 106 and at its opposite end at the juncture of braces 107 and 108. At the one end of the rectangular frame, at the juncture of 101, 103 and 107 and the juncture of 102, 103 and 108, are welded additional supporting bars 110 and 111, respectively, joined at their outer meeting ends by an angular fastening bar 112. The fastening bar 112 is a right angular bar having an upper horizontal flange 113 to which bars 110 and 111 are welded and a vertical flange 114. The vertical flange 114 is provided with perforations 115 by which the supporting framework can be bolted, by suitable bolts and water sealing washers 116, to a backboard 117 of boat 118. In a metal boat the flange 114 can be welded to the backboard 117. When the framework 100 is positioned in a boat, the bars 101 and 102 preferably extend somewhat over half the length of the boat and are secured to cross bars 103 and 104 which are measured to an exact length, relative to width of the boat, to rest the frame 100 on the boat bottom 10 and support the motor C and gear housing A, in the manner as illustrated in Figure 5. The frame 100 sits close to the bottom of the boat 118 with bars 101 and 102 fitted against the boat sides 119 and 120, respectively, and the center bar 109 resting against the boat bottom 10 at its approximate center line.

To aid in supporting the motor a flat plate or bar 121 is welded between the side bars 101 and 102. The plate 121, bars 101 and 102 are provided with apertures 122 over which are aligned apertured mounting lugs 123 of motor C for fastening down by suitable bolts 124. Thus the motor C is supported by the frame 100 and is connected through shaft housing 23' to gear housing A. The gear housing A is supported on flange 113 of frame portion 112 and cross bar 103 by a collar 125. The collar 125 may be provided as lugs 126 on the sides 25 and 26 of gear housing 22, as shown in Figure 1.

In the conventional handling of a boat the reverse gear-
ing, as indicated, normally backs the boat for short dis-
tances in known waters. However, where the underwater
condition is unknown and may contain some underwater
obstruction the present device permits a complete revolu-
tion of the propeller housing B so that the lever arm
79 is on the advancing side and makes first contact with
an obstruction to unlock and tip the housing and simul-
taneously shut off the motor, in the manner as described.
With this disclosure, a preconstructed conventional light
boat can now be subsequently provided with a perma-
nently installed relatively heavy motor and propeller as-
sembly, of the character as herein described, when in-
stalled in combination with the improved auxiliary and
supplemental reinforcing and supporting framework, as
described. With this assembly the light framework of
the boat and its bottom are reinforced to withstand weight
and shock of a motor and propeller assembly installation,
without requiring additional building or rebuilding to pro-
vide heavier ribbing and heavier boat structure.

In accordance with the patent statutes, I have described
the principles of construction and operation of my im-
provement in protecting motor boat drive, and while I
have endeavored to set forth the best embodiment there-
of, I desire to have it understood that obvious changes
may be made within the scope of the following claims
without departing from the spirit of my invention.

I claim:

1. A propeller driving mechanism comprising in com-
bination an intermediate drive shaft, a housing for said
intermediate drive shaft, a detachable drive shaft includ-
ing an impeller and associated housing pivotally mounted
on said intermediate drive shaft housing, interconnecting
clutch means on said shafts engageable in one pivotal po-
sition of said detachable drive shaft, and an underwater
self-releasable locking lever pivotally mounted on the for-
ward end of said associated impeller housing, means on
said drive shaft housing engageable with said locking
lever for protectively and releasably securing said asso-
ciated impeller housing and detachable drive shaft in op-
erative relationship with said intermediate drive shaft and
housing therefore.

2. In combination a boat having a bottom, side and
back board, a supplemental framework mounted in the
bottom portion of said boat, a motor and gear housing
containing associated gears supported by said framework,
an intermediate drive shaft and associated pivotal hous-
ing connected to said gear housing extending through the
bottom of said boat, a detachable propeller housing includ-
ing a propeller and a propeller drive shaft connected for
operation in unison, means pivotally connecting said pro-
peller housing to said associated pivotal housing, clutch
means connecting said intermediate drive shaft and said
propeller drive shaft in one relative pivotal position there-
of, and pivoted latch means on said propeller housing de-
tachably engageable with said associated pivotal housing
for holding said housings in said one relative position,
whereby, when said latch means is pivoted to disengage
said associated pivotal housing, said propeller housing
may pivot and said intermediate drive shaft and said pro-
peller drive shaft may declutch.

3. In combination a protective structure for a prebuilt
boat having a permanently installed motor and propeller
drive assembly subsequently inserted therein comprising
a motor mounting framework consisting of a rectangular
frame portion resting against the sides of the boat, angu-
larly positioned depending braces extending downwardly
and meeting inwardly at the center of the boat, a con-
necting bar joining the meeting point of said braces and
supporting the said rectangular frame portion above the
bottom of the boat, a motor mounted on said framework,
a drive shaft connected to said motor and supported by
said framework, a pivotal housing extending through the
bottom of the boat and sealed in water tight relationship
therewith, a detachable propeller housing including a pro-

pellor and propeller shaft hingedly connected to said
pivotal housing beneath the boat, a clutch connection be-
tween said drive shaft and said propeller shaft in one
pivotal position of said propeller housing, and releasable
latch means on said propeller housing detachably con-
necting said propeller housing to said pivotal housing in
said one pivotal position, whereby when said releasable
latch means engages an underwater obstruction, the latch
will release, and the force of the impact will be trans-
mitted through said pivotal housing to said framework.

4. In the structure of claim 1, the combination includ-
ing ignition circuit control contacts, lever means associ-
ated with the said intermediate drive shaft engageable
with said contacts for operating said contacts, means on
said associated impeller housing engaging said lever
means when said impeller housing is in said one position
for closing said contacts, and cooperative spring means
associated with said lever for quickly disengaging said
contacts upon pivotal movement of said impeller housing.

5. In combination a boat having a protective arrange-
ment for the motor drive assembly comprising a gear
housing, forward and reversing gears in said gear housing,
a drive shaft for said gears, an intermediate drive shaft
driven by said gears, a housing adapted to be perma-
nently attached through a boat bottom for supporting said
intermediate driven shaft, an aperture through said driven
shaft, a push rod movable between a raised and lowered
position and extending from said aperture, a contact
switch adapted to be closed by said push rod when it is
held in a raised position, a pivotally mounted propeller
housing containing a propeller drive shaft and propeller
pivotally mounted to said housing for said intermediate
drive shaft, a clutch connection between said intermediate
driven shaft and said propeller drive shaft in one pivoted
position of said propeller housing, a pivoted lever attached
to the forward end of said propeller housing detachably
engageable with said intermediate drive shaft housing
to hold said propeller housing in said one pivotal po-
sition, and means supported by said propeller housing en-
gaging said push rod in said one pivotal position to hold
said push rod in said raised position.

6. The structure of claim 1 wherein said releasable
locking lever arm pivotally mounted on said associated
impeller housing is provided with a locking slot and the
said means on said housing for said intermediate drive
shaft engageable with said locking lever comprises a co-
operable pin engageable in said slot for locking said im-
peller housing to said intermediate drive shaft housing.

7. The structure of claim 6 wherein, the said releasable
locking lever arm pivotally mounted on said impeller
housing is held in spaced relationship thereto and in lock-
ing engagement with said cooperable pin by a compres-
sion spring mounted between the said arm and the said
housing.

8. The structure of claim 2, wherein said supplemental
framework comprises parallel bars resting against the
inner sides of said boat and parallel end bars forming
a rectangular frame therewith, depending braces extend-
ing downwardly to a center bar in parallel relationship
to said first indicated parallel bars, and rearwardly ex-
tending bars ending in a fastening plate securing said
framework to the backboard of said boat.

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