

Oct. 25, 1960

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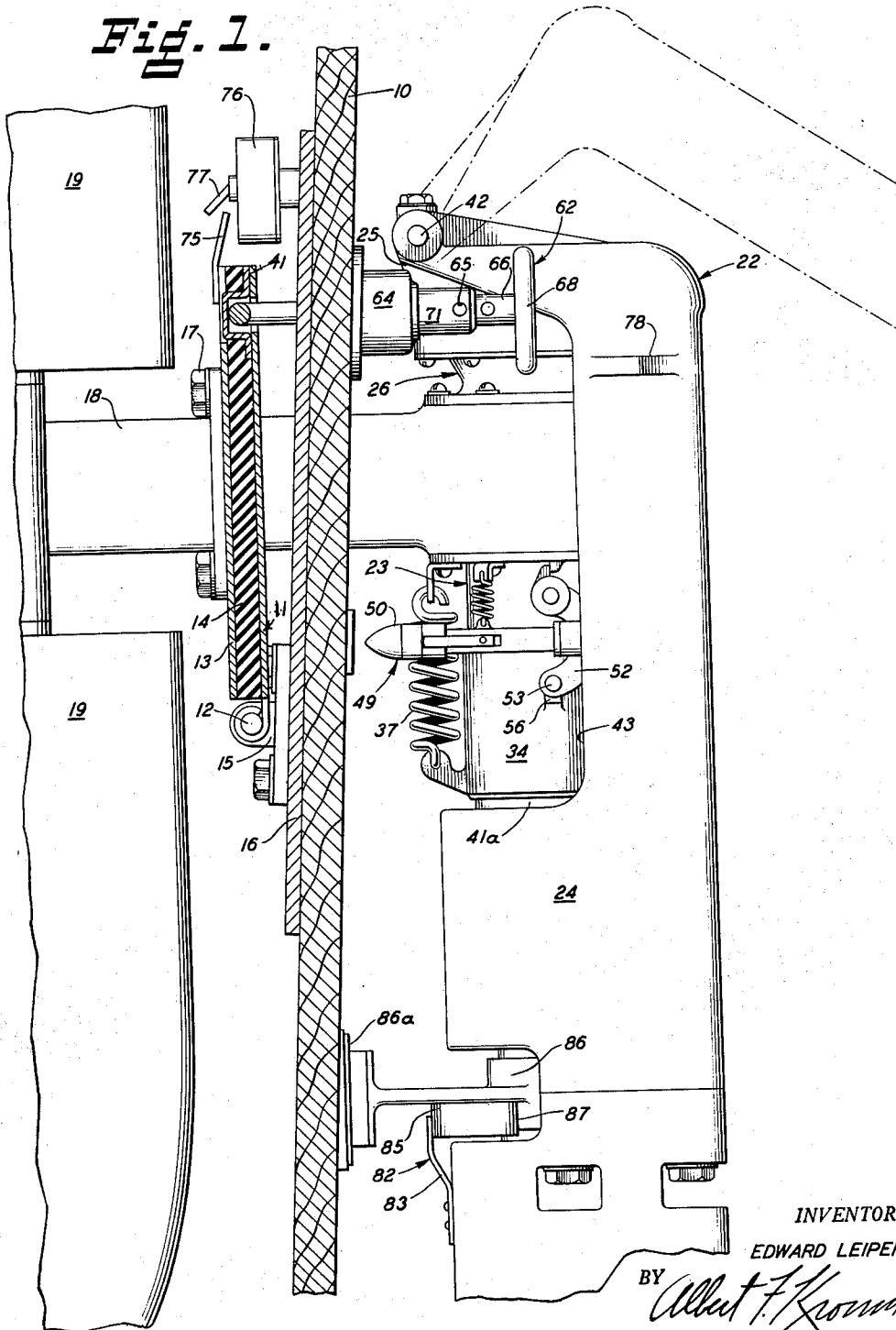
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MOTOR BOAT DRIVE MECHANISM

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6 Sheets-Sheet 1

Fig. 1.



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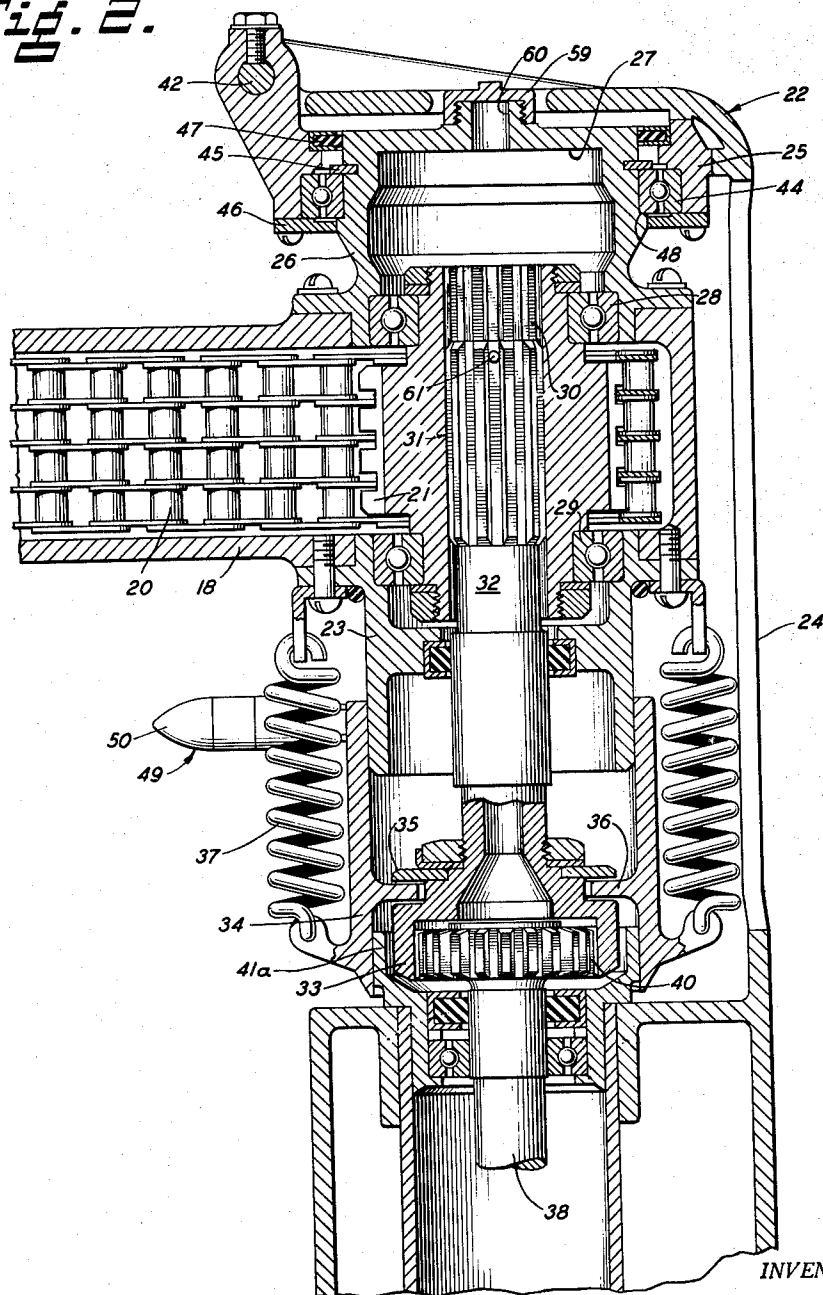
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6 Sheets-Sheet 2

Fig. 2.



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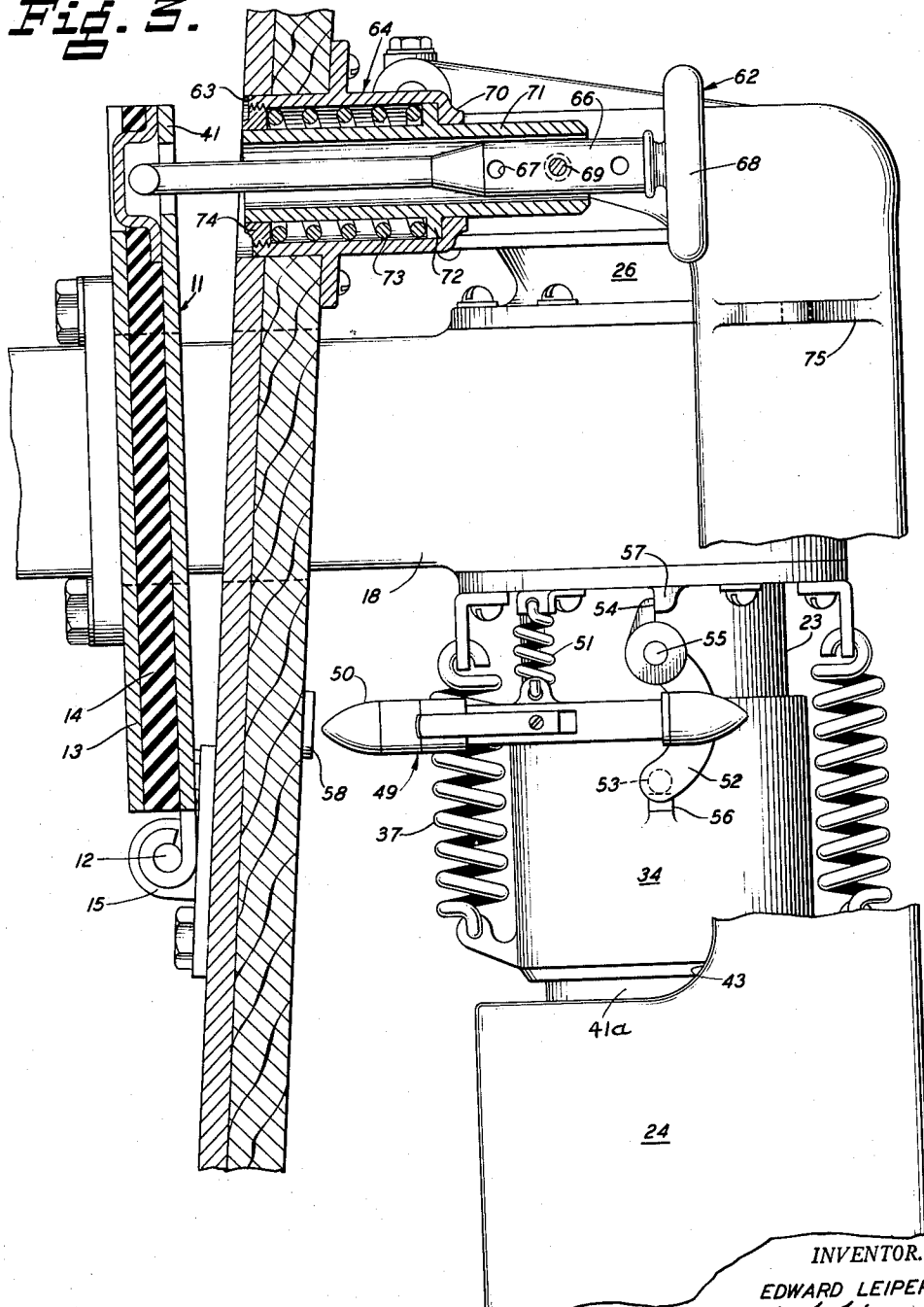
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MOTOR BOAT DRIVE MECHANISM

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6 Sheets-Sheet 3

Fig. 3.



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MOTOR BOAT DRIVE MECHANISM

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Fig. 4.

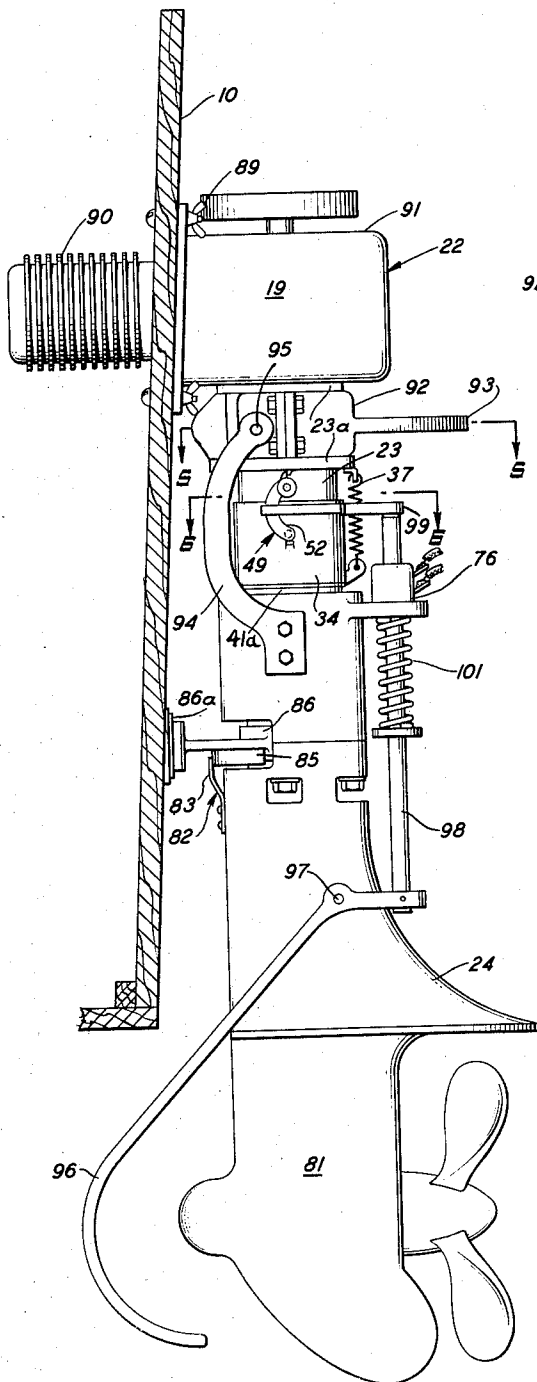


Fig. 5.

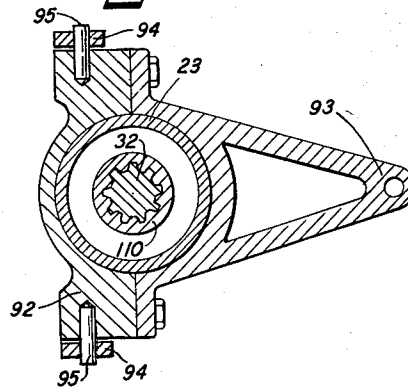
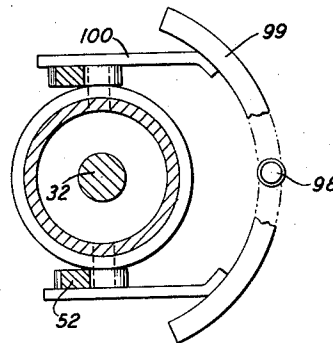


Fig. 6.



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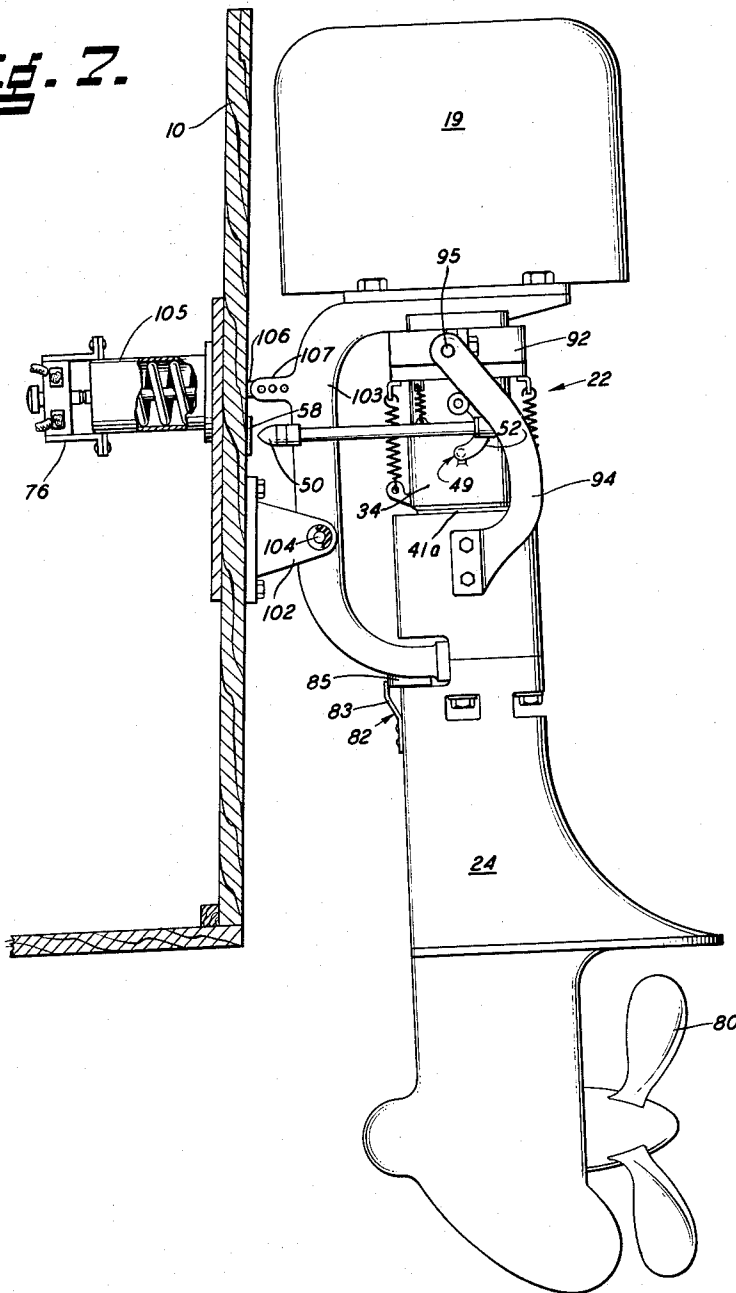
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6 Sheets-Sheet 5

Fig. 2.



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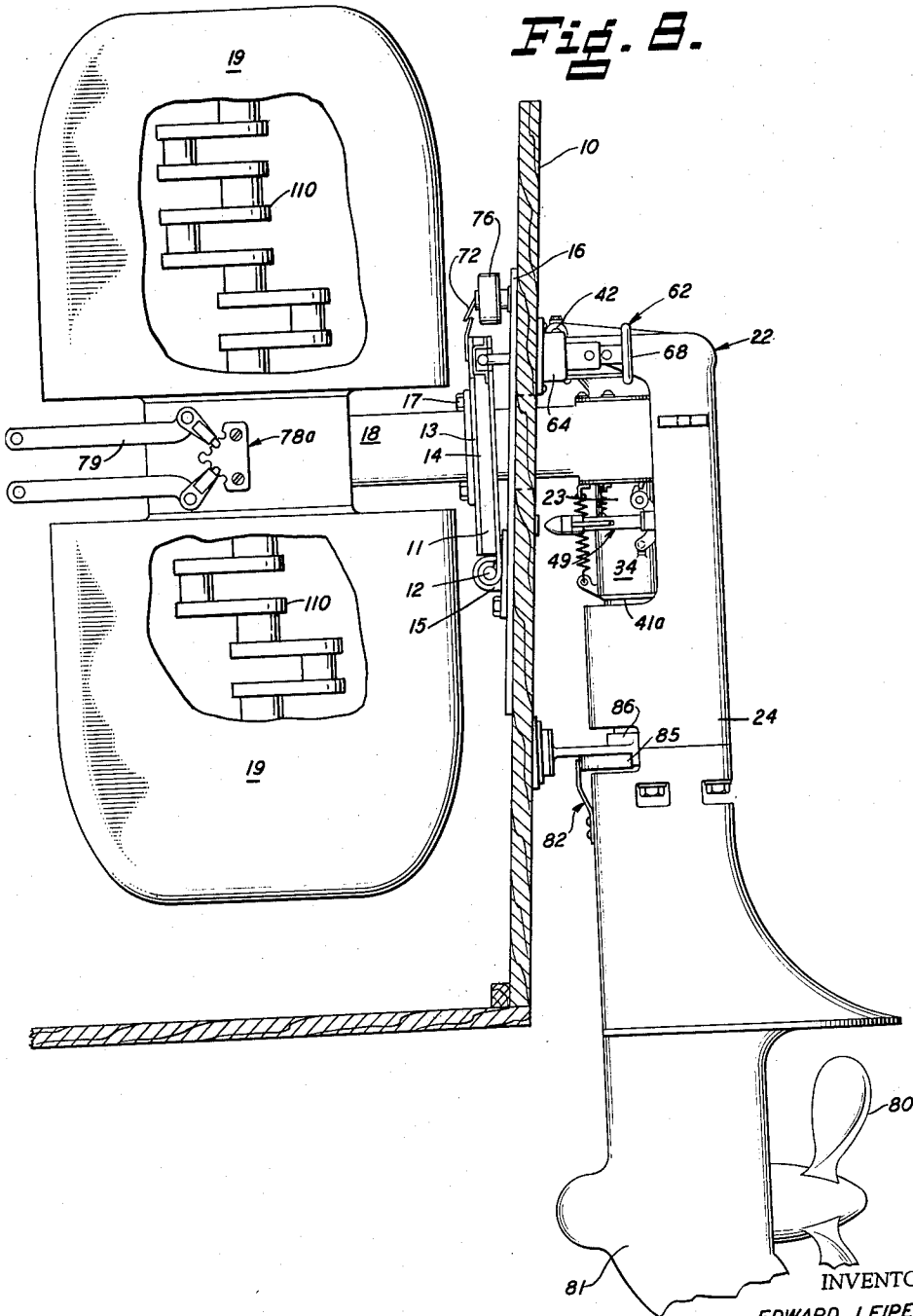
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MOTOR BOAT DRIVE MECHANISM

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6 Sheets-Sheet 6

Fig. 8.



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MOTOR BOAT DRIVE MECHANISM

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16 Claims. (Cl. 115-41)

This invention relates to boat drive mechanisms and particularly to devices in which the propeller drive shaft is mounted vertically and carried outboard of the boat.

It is well known to attach boat motors to the transom of a boat for marine propulsion. Presently known devices, however, require that the motor as well as the propeller be turned for steering purposes. Other proposed structures keep the motor and propeller fixed but rely upon a rudder for steering purposes.

Where larger craft are propelled by "outboard motors" the stern transoms of the vessels have to be cut down to bring the propellers to the proper depth below the boat. Extra-long propeller shafts and housings used to overcome this difficulty present other problems in design, operation and handling. In addition the outboard mounting of large motors not only becomes awkward but may unbalance the boat. Furthermore, with motors that must swivel for steering purposes and tilt to a high degree in order to raise the propeller out of the water, the hooking up of controls becomes highly complicated and difficult.

Accordingly, it is an object of the present invention to provide an engine and propeller drive for a boat in which the engine is mounted inboard of the transom and the propeller, and its housing is pivotally and swingably mounted on the outside of the transom.

Another object of the present invention is to provide a drive mechanism for a boat in which the propeller and its housing will swing upwardly upon striking an object without substantially disturbing the motor.

A further object of the present invention is to provide a boat propulsion device in which the motor will be stopped before the swing of the propeller housing disengages the propeller drive shaft from the motor.

Another object of the present invention is to provide a device for reengaging the motor and drive shaft with ease.

An object of the present invention is to provide an outboard drive for boats which will not require that the stern transom be cut down.

A further object of the present invention is to provide a more favorable distribution of weight inboard as well as outboard of the boat.

Still another object of the present invention is to provide a boat propelling device which will incorporate the advantages of both inboard and outboard propulsion while overcoming some of the disadvantages.

A feature of the present invention is its "Quick Release" mechanism for detaching the movable portion of the propeller drive from the fixed part.

Still another feature of the present invention is the use of impact springs to absorb the initial shock of striking an underwater object and permitting the outboard unit to yield during which time the "Quick Release" mechanism is being triggered for full release of the movable portion of the drive.

Another feature of the present invention is its novel

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mounting bracket arrangement for the motor and outboard propeller drive unit.

A further feature of the present invention is its use of a resettable sleeve rather than frangible structures to protect the propeller drive unit from the impact of underwater objects.

Another feature of the present invention is its means for steering the propeller drive unit without moving the motor.

Still another feature of the present invention is the use of a trip arm carried by and leading the propeller drive housing to release the housing from the fixed drive.

A further feature of the present invention is its use of an inboard mounted engine having a vertically positioned crankshaft whose power is transferred to an outboard drive unit by any suitable means, such as a roller chain.

A feature of the present invention is its adaptability to the use of two engines to drive a single propeller when both engines and their crankshafts are mounted vertically, one directly over the other.

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 are illustrated three forms of embodiment of the invention, and in which:

Figure 1 is a somewhat fragmentary view in side elevation of the upper portion of a boat propeller drive unit according to one form of the present invention.

Figure 2 is a view in vertical section, somewhat enlarged of the drive unit shown in Figure 1.

Figure 3 is a view in side elevation, somewhat enlarged and partly broken away, of the drive unit shown in Figure 1.

Figure 4 is a view in side elevation of a second embodiment of the present invention.

Figure 5 is a sectional view taken on line 5-5 in Figure 4 looking in the direction of the arrows.

Figure 6 is a sectional view taken on line 6-6 in Figure 4 looking in the direction of the arrows.

Figure 7 is a view in side elevation of a third embodiment of a boat driving mechanism according to the present invention.

Figure 8 is a view in side elevation of the entire embodiment shown in Figure 1, on a reduced scale.

Referring to the drawings and particularly to Figures 1, 2, 3, and 8, 10 indicates the stern transom of a boat. A support or mounting plate 11 is secured to the inside of the transom 10 by the hinge-like member 12, hereinafter referred to as the "Primary Fulcrum Point." The support plate 11 may comprise opposed sheets of metal 41 and 13, between which there is sandwiched a rubber, vibration absorbing layer 14. The fixed portion 15 of the hinge member 12 may be secured to a metal plate 16 which in turn is fastened to the transom 10.

Bolted to the plate 11 as shown at 17 is a power transfer drive housing 18. The transfer housing extends through the plates 41 and 13 and transom 10, which are cut out to receive the said housing 18. The housing 18 serves as the horizontal support member for the motor or motors 19, as well as the entire outboard drive unit 22. In Figure 1 two such motors 19 have been shown mounted above and below the housing 18, and secured thereto.

The crankshafts 110 of each motor 19 are vertically disposed and adapted to engage a drive such as the drive chain 20, best shown in Figure 2. The chain 20 extends through the housing 18 and around a sprocket gear 21 within the outboard drive unit 22. The outboard drive unit 22 consists of a rigidly mounted portion 23 and a swingable portion 24. The swingable portion

24 is freely secured to a rotatable cap 25 on the housing 26 of the rigid portion 23, as indicated at 42 in Figure 1. The pivot 42 will hereinafter be referred to as the "Secondary Fulcrum Point." The rigid portion 23 of the outboard drive unit 22 (best shown in Figures 2 and 3) includes a housing 26 which is secured to the power transfer housing 18. The upper portion of the housing 26 is formed into a chamber 27 in the lower part of which there is carried a ball bearing race 28. The sprocket gear 21, which is carried within the transfer housing 18, is journaled at its upper end within the ball bearing 28. The lower end of the gear 21 is rotatably supported by the ball bearing member 29. The sprocket gear 21 is centrally bored and internally splined as indicated at 30 in Figure 2 to receive the sliding splined end 31 of the driven shaft 32. The sprocket gear 21, will drive the shaft 32 to which it is coupled, through the splines, as it rotates within the transfer housing 18.

The power received by the shaft 32, from the sprocket gear 21, is applied to a gear 40 (Figure 2) securely fastened on the top end of the vertical propeller drive shaft 38. The gear 40 is coupled to the shaft 32 by means of an internal gear 33. The internal gear 33 is formed on the bottom of the shaft 32 and is adapted to slide over and mesh with gear 40 (forming a familiar gear type coupling). The shaft 38 in turn transmits its power to a horizontal propeller shaft, to which is attached the propeller 80 (shown in Figure 8). Any suitable and presently known means, such as bevel gears, may be employed for this purpose.

A sleeve member 34, hereinafter referred to as the locking sleeve) best shown in Figures 2 and 3) is slipped over the rigid portion 23 of the outboard drive unit 22 and secured thereto with coil springs 37. The swingable and rotatable portion 24 of the outboard drive unit 22 has, constructed within it, a tubular member 41^a (Figure 2). When in normal operating position the locking sleeve 34 is slipped down over this tubular member 41^a, thereby in effect, locking and aligning the swingable portion 24 to the rigid portion 23. However, since the member 41^a is of a tubular section, it will be rotatable within the sleeve for steering purposes. Additionally the portion of the tubular member 41^a that fits into locking sleeve 34 becomes a second bearing point about which the swingable and rotatable portion 24 is moved for steering purposes.

The locking sleeve 34 is provided, on its inner wall, with an annular boss or ring 36, which is loosely clamped to the splined shaft 32 (Figure 2) between the upper face of the internal gear 33 and a washer nut assembly 35. It will therefore be apparent that any movement of the locking sleeve 34 will carry with it the sliding splined shaft 32 as well as the internal gear 33 which is an integral part of it.

As previously stated, the locking sleeve 34 is secured to the rigid housing 23 by coil springs 37. In the running position of the outboard drive, these springs are under tension. Obviously, the spring loading of the locking sleeve would cause it to move upwardly and release the swingable portion 24 to rotate about its fulcrum point 42 were it not for a restraining device hereinafter called the "Quick Release" mechanism and which is more fully described later.

The swingable portion 24 of the outboard drive unit 22 is cut away, as indicated at 43 in Figures 1 and 3, for the purpose of enabling the swingable unit 24 to be moved about the rigidly mounted portion 23 for steering the vessel. This construction also permits the unit 24 to swing upward to clear an obstruction. The manner in which the swingable portion 24 may be rotated about its longitudinal axis for the purpose of steering will be apparent from an examination of Figure 2. The swingable portion 24 of the outboard drive unit 22, as has been previously stated, is pivotally secured at 42 to a

rotatable cap 25 which is carried upon the upper portion of the housing 26. The cap 25 rides upon ball bearing members 44 which are slipped upon the housing 26. A snap ring 45 and a bearing retainer plate 46 secured to the bottom of the cap member 25, serve to hold the cap member 25 and the ball bearing 44 together. The ball bearing 44 is prevented from slipping down the housing 26 by a small step 48 provided therein. When the movable portion 24 of the outboard drive unit 22 is turned for steering purposes, it carries with it the cap member 25 as well. A resilient gasket member 47 is disposed between the cap member 25 and the housing 26 to prevent foreign matter from reaching the ball bearing 44.

The locking sleeve 34 is held in the operating position by means of a "Quick Release" device generally indicated at 49 in Figures 1, 2, 3. The "Quick Release" device 49 consists of a trigger member 50 which projects outwardly from the housing 23 in the direction of the transom 10. A small protective plate 58 may be provided on the transom adjacent to the trigger 50 to prevent damage to the transom 10 from contact therewith by the trigger 50. The trigger 50 consists of an arm to which is screwed an adjustable nose piece and to the other end of which there is secured an arcuate segment 52. The segment 52 is pivotally secured to the housing 23 by a stub shaft 55. The locking sleeve 34, which is held by springs 37 to the housing 23, is provided with a small loading platform 56, best shown in Figure 3. The loading platform 56 lies directly below a roller 53 on the segment 52 when the detent 54 is in contact with a stop 57 secured to the housing 23. In this position of the "Quick Release" device the springs 37 will be extended, the locking sleeve 34 will be in its engaged position, and the socket or internal gear member 33, which is controlled by the sleeve 34, will be coupled to the gear 40 for transmitting power to the propeller.

A small spring 51 is employed to support the trigger 50 to prevent vibration or the like from releasing the sleeve 34.

In the event that the outboard drive unit 22 strikes a submerged object while the boat is underway, the bottom of the unit will be moved away from the transom 10. The initial motion of the unit 22 will be transmitted through the entire unit and the transfer drive housing 18, to the support plate 11. The support plate 11 will thereupon swing forwardly about the "Primary Fulcrum Point" 12, thereby bringing the "Quick Release" trigger 50 into contact with the plate 58 on the transom 10. As soon as the trigger 50 reaches the plate 58 it can go no further and additional rotation of the plate 11 will cause the trigger 50 to push the roller 53 of the segment 52 off the loading platform 56. As soon as the roller 53 leaves the loading platform 56, the locking sleeve 34 will be released. The springs 37 will pull the sleeve upwardly, causing the said locking sleeve 34 to pull the internal gear 33 away from and out of engagement with the gear 40. At this juncture, the locking sleeve will also slip away from the tubular member 41^a of the swingable portion 24 of the outboard drive unit 22 (Figures 1, 2, 3) permitting it to swing or pivot about its "Secondary Fulcrum Point" 42, and thereby swing upwardly with the propeller and away from the submerged obstacle, thus protecting itself from damage. The design is such that the gear coupling consisting of gears 33 and 40 will be completely separated before the locking sleeve 34 has fully slipped off the tubular member 41^a of the swingable portion 24. By so doing, possible damage to gears from clashing will be eliminated. Furthermore, at this point engine ignition has been cut off as hereinafter more fully described, thereby preventing damage to the motor. The "Quick Release" trigger 50 may also be tripped by hand when it is desired to beach or transport the vessel.

When it is desired to reengage the two portions of the outboard drive unit 22, they are brought into alignment and a small cap member 59 carried upon the top of the

housing 26 is removed. A rod or reset key (not shown) may be inserted through the bore 60 provided below the cap 59 until a small pin 61, which traverses the hollow shaft 32, can be engaged by the key. The key is preferably formed with a slot in the end thereof to receive the pin 61. Pressure is applied to the top of the rod, while it is rotated slightly until the socket or internal gear 33 slips over and meshes with the gear 40. Thereupon, the segment 52 will fall into place so that the roller 53 rests upon the loading platform 56. The unit is then again in operating position.

Referring to Figures 1, 3, and 8, there is shown a spring assembly 64, hereinafter referred to as the "impact springs." One or more of such structures may be employed as shown in Figures 1 and 8, to maintain the support plate 11 in an upright position and control the angle or tilt thereof. In addition, the impact springs will permit the entire outboard unit (including motor) to yieldably rotate when an underwater obstacle is struck and so permit the aforementioned "Quick Release" trigger 50 to function as the unit turns about its "Primary Fulcrum Point" 12. The action of the impact springs and the spring pressure is predetermined and adjusted to prevent rapid deceleration, reversing or striking of small floating objects from triggering the "Quick Release" mechanism.

As shown in Figure 3, the housing 64 is a two part structure and consists of an outer shell 70, which is secured to the transom 10 and an inner portion 71 which is slideable within the outer shell 70. The transom 10 is bored at 63 to receive the shell 70. The inner portion 71 is provided with a flange 72. A spring member 73 is disposed around the member 71 and abuts the flange 72. An adjustable, threaded ring 74 is located at the inboard end of the outer shell 70 to retain and adjust if required, the impact spring resistance. Connecting the inner portion 71 of the assembly 64 with the vertical support plate 11 is a rod or link 66 which is freely secured at the inboard end to the plate 11 and also freely secured by means of a clevis pin 69 to the inner portion 71 of the spring assembly 64. It will be obvious therefore that a force such as striking an object, exerted at the lower end of the swingable portion 24 will be transmitted through the entire outboard unit 22 to the transfer housing 18, then, through plate 11 to rod 66, finally to clevis pin 69, Figure 3. Since the pin 69 projects through a bored hole in inner portion 71 of assembly 64, the force or impact is ultimately transmitted to the spring member 73 which yieldably resists it. If the impact is great enough, the entire unit will rotate about fulcrum 12 until trigger 50 strikes the plate 58 on the transom 10 and releases the locking sleeve 34. Forces created by rapid deceleration, reversing propeller, and striking small floating objects, will be further resisted by a yieldable latching device shown at 82 in Figures 1, 4, 7, and 8, which will later be described.

It should be further noted that rod 66 (Figure 3), is transversely bored in several places at the outboard end thereof. After removing clevis pin 69, the angle or tilt of the outboard unit 22 with relation to the transom 10 may be changed by pulling or pushing on the handle 68. Upon obtaining the proper tilt the clevis pin 69 is slipped through the bore 65 (Figure 1) of part 71 and also through any one of the several holes 67 in rod 66 that may line up with it. A thrust block 86 may be adjusted by shims 86a to produce the proper lower support for swingable and rotatable portion 24 (Figure 1).

The yieldable latch device 82 consists of a flat spring member 83 which is secured to the swingable portion 24 of the drive unit 22, and a quadrant 85. The flat spring 83 extends upward and outward from the housing 24 and engages the outer surface of the quadrant 85. The quadrant is secured to or formed integrally with the thrust block or bearing 86 which is in turn secured to transom 10. The quadrant 85 is arcuate in shape so that the spring

83 can slide along its outer surface during the steering of the outboard drive unit 22. At each extremity of the quadrant 85, there is an inwardly bent portion or ramp 87 (Figure 1) to pick up and permit the flat spring 83 to be redirected over the outer surface of the quadrant 85, following the release of the latch member 82, as herein-after described.

When the boat is being propelled through the water the latch member 82 holds the lower part of the outboard drive unit 22 in contact with the thrust bearing 86. During deceleration or reversing of the motor, which action would tend to force the lower housing away from the transom 10, the latch member 82 with the help of the impact springs 73 serves to maintain the contact of the lower housing 24 with the thrust bearing 86. However, should part of the housing strike a submerged object, the impact would cause the flat spring member 83 to yield until it snaps clear of the quadrant 85. Thereafter, the housing 24 would swing upwardly in the manner already described. The operation of the latch member 82 also serves to take up some of the shock load which would be applied to the sleeve 34, upon impact of the housing 24 with a submerged object. The shock load is lessened because the flat spring 83 will remain in contact with the quadrant 85 until the "Quick Release" trigger 50 has tripped and released the locking sleeve 34. It will be seen that the flat spring 83 also assists the impact springs 73 in resisting sudden shocks on the drive unit 22.

It is important for the preservation of the motor or motors 19, that the power to the outboard drive unit 22 be stopped as soon as the housing 24 strikes a submerged object. Accordingly, there is provided a cut-off switch mechanism shown in Figures 1, 4, 7 and 8, at 76. The cut-off switch 76, in one embodiment, is connected between the plate 11 and the transom 10 of the boat. When the housing 24 strikes a submerged object the initial rotation of the unit 22 about the "Primary Fulcrum Point" 12, brings the contact member 75 to bear against the complementary element 77 whereupon the ignition of the motors will be cut off bringing the said motors to an immediate stop. The ignition cut-off device 76 is so arranged and adjusted that the motors 19 will stop before the internal gear 33 is fully withdrawn from the gear member 40. In this manner, there will be no chance of damage to the coupling as it separates.

The movable portion 24 of the outboard drive unit may be rotated for steering purposes by means of a tiller arrangement (not shown) or by means of some suitable linkage attached to the arm 78 (Figure 1) which extends laterally from the swingable housing 24.

A drive direction control device generally indicated at 78a in Figure 8 may be provided on the motor housing. The control device is actuated by means of levers 79 which extend inboard of the motor. It will be seen from the showing of Figure 8 that the entire unit (motor and outboard propeller drive) is secured to the stern transom 10 of the boat and makes contact with no other part of the vessel. The mounting of the unit is such that in the first embodiment of this invention there will be an approximate balance of weight between the motors 19 and the complete outboard drive unit about the "Primary Fulcrum Point" 12. As a result should the propeller housing 81 strike a submerged object, the stresses on the entire structure will be less severe, since a natural rocking effect is achieved about the "Primary Fulcrum Point" 12.

Referring to Figure 4 there is shown a second embodiment of the present invention in which the motor 19 is mounted partially outboard of the stern transom and partially inboard of the stern transom of the vessel. In this embodiment, the motor section of the drive unit 22 remains stationary at all times and only the lower portion of the unit is capable of movement about a single fulcrum point. The motor 19 is secured directly to the transom 10 by means of wing-nuts 89 or some other

suitable fastening means. The transom 10 is bored to receive therethrough the cylinder or cylinders 90, of the motor. In the case of two cycle engines it may be preferred to extend the carburetors through the transom 10 and have the engine cylinders extend outward. The crankcase 91 of the motor 19 is placed outside the stern of the boat. The crankshaft of the motor 19 is vertically disposed and is preferably connected to the driven shaft 32 by means of a splined coupling 110 (Figure 5), secured to the lower end of the crankshaft and in effect replacing the sprocket wheel 21 which was connected to the shaft 32 in the first embodiment of the present invention.

For steering purposes a split collar type of bearing 92 (Figure 4) is freely clamped to a tubular section of the housing 23 which is securely fastened to the underside of the engine crankcase 91. To locate and prevent the bearing 92 from slipping upward or downward, flanges or shoulders 23^a are provided on the housing 23 above and below the bearing 92. Extending outwardly from the bearing 92 is an arm 93 to which steering controls may be attached. The swingable and rotatable portion 24 of the outboard drive is connected to the bearing member 92 by two arms 94. The arms 94 are pivotally secured to the bearing 92 by a fulcrum pin or shaft indicated at 95. A forwardly extending trip arm 96 is pivotally secured to the lower housing 24, and extends in front thereof. When the arm 96 encounters a submerged object, it turns about its pivot point 97 and, acting through the linkage 98, releases the trigger mechanism 49. The travel of the linkage 98 also actuates ignition cutout switch 76. The engine is thereby stopped and the lower housing 24 is disengaged by locking sleeve 34 and allowed to swing upwardly about the fulcrum point 95 on the bearing member 92. It will be seen that the linkage 98 in this embodiment of the invention performs the same function as the trigger member 50 (shown in Figure 1). Upon activating the "Quick Release" device 49, the locking sleeve 34 will snap upwardly due to the urging of the springs 37, to disconnect the driving section of the outboard drive unit 22 from the driven section which is carried within the swingable portion 24.

In order to permit the swingable portion 24 to be rotated for steering purposes, and enable the linkage 98 to remain in contact with the "Quick Release" mechanism 49, it is necessary to provide an arcuate track 99 on the outboard end of the "Quick Release" mechanism 49. The arcuate track 99 (best shown in Figure 6) is linked to the trigger mechanism segments 52 by means of arms 100. The linkage 98 underlies the track 99 and is spring loaded by the coil spring 101 to prevent small obstacles contacting trip arm 96 from actuating the "Quick Release" device. The spring 101 also serves to bring the said linkage 98 back to its original position after a tripping operation.

The flat spring latching device 82 shown in Figure 4, is employed to perform the function heretofore described. In this embodiment, however, it will not have the assistance of the impact springs 73 which are not required. It will be seen that in this second embodiment of the present invention the motor 91 will remain stationary despite any swing or rotation of the lower housing. While a single cylinder engine 90 has been illustrated, it is to be understood that motors having a plurality of cylinders and even drives incorporating more than one motor disposed in side by side or vertical relationship may be employed. However, it is preferred that the crankshaft of said arrangement be vertically positioned.

Referring to Figure 7 there is shown still another embodiment of the present invention in which the entire motor is carried outside of the craft and the entire outboard drive unit is pivotally secured to the outside of the transom 10 of the boat by a bracket 102. In this embodiment of the invention the crankshaft of the motor 19 is vertically disposed and coupled to the driven shaft

32 directly, by means of a splined coupling in the same manner as has been hereinabove set forth in connection with the second embodiment (Figure 4). A combined motor support and thrust block member 103 is employed to hold a motor 19, which is firmly secured at the upper end thereof. The lower end of member 103 acts as a thrust block or bearing giving support to the lower swingable portion 24 of the outboard drive unit 22. The member 103 is also constructed to include the arcuate segment 85 employed in all the embodiments of the present invention, the function of which together with spring latch 82 has already been explained. The support 103 is secured at a "Primary Fulcrum Point" 104 to the bracket 102. When the swingable portion 24 encounters a submerged object the entire unit will be rotated about the fulcrum pin 104 of the bracket 102. The trigger 50 will then be brought into contact with the plate 58 on the transom 10, resulting in the release of the "Quick Release" mechanism 49. As a result, the lower housing 24 is released from the fixed portion of the outboard drive and is able to swing upwardly by the two arms 94 about the "Secondary Fulcrum Point" 95, which is part of the split collar type bearing 92.

The swing of the outboard drive unit about the fulcrum point 104 upon striking a submerged object is controllably resisted by an impact spring assembly 105 and the flat spring latch 82. The impact spring assembly 105 is linked to the outboard motor and drive unit support 103 by a rod 106 which traverses the transom 10. The rod 106 is formed with a clevis pin hole in the outboard end thereof. A clevis like member 107 is attached to a part of the support bracket 103 and is bored to provide a series of several clevis pin holes. The clevis member 107 is connected, by means of a clevis pin, to rod 106. By removing this pin and replacing it in a different hole in the clevis 107, a tilt adjustment of the entire unit can be quickly accomplished.

The "Secondary Fulcrum Point" pin 95, extends outwardly beyond its bearing areas so that a steering lever arm or control cables may be attached thereto.

It will be seen that in both this embodiment and that first described, of the present invention, the rotary motion imparted to the motor section 19, upon impact with a submerged object, is relatively small. However, the lower unit 24 is capable of swinging out of the way of potential damage as soon as the resistance of the restraining spring members have been overcome and the trigger 50 is brought into contact with the plate 58.

From the foregoing it will be seen that there has been provided outboard drive units capable of being attached to a boat without the necessity for reducing the depth of the stern transom thereof. The entire power plant of the device and the outboard drive unit is secured only to the stern transom and there is no contact with the bottom of the boat. As a result, it is possible to apply the outboard drive unit made in accordance with the present invention to all types of craft without modifying the design thereof, and without decreasing the seaworthiness of the said craft. Outboard drive units in accordance with the above disclosure occupy a minimum amount of space within the boat and lend themselves to the use of heavier driving means than are presently practicable.

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. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor supported by the transom, a propeller drive unit operatively connected to the motor and supported by the transom, said drive unit comprising a fixed section and a movable section, pivot means rotatably carried by the fixed section and attached to the movable section whereby the said movable section can swing and rotate independently of the motor and means including a slidable sleeve for

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operatively connecting and locking the movable section to the fixed section.

2. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor supported by the transom, a propeller drive unit operatively connected to the motor and supported by the transom, said drive unit comprising a fixed section and a movable section, pivot means rotatably carried by the fixed section and attached to the movable section whereby the said movable section can swing and rotate independently of the motor and means including a spring loaded slidable sleeve for operatively connecting and locking the movable section to the fixed section.

3. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor supported by the transom, a propeller drive unit operatively connected to the motor and supported by the transom, said drive unit comprising a fixed section and a movable section, pivot means rotatably carried by the fixed section and attached to the movable section whereby the said movable section can swing and rotate independently of the motor and means including a spring loaded slidable sleeve for operatively connecting and locking the movable section to the fixed section, and trigger means carried by the propeller drive unit and connected to the slidable sleeve to release the said sleeve and unlock the movable section.

4. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor, a plate pivotally supported by the transom, means to support the motor by the plate, a propeller drive unit operatively connected to the motor and supported by the plate, said drive unit comprising a fixed section and a movable section, pivot means rotatably carried by the fixed section and attached to the movable section whereby the said movable section can swing and rotate independently of the motor and means including a slidable sleeve for operatively connecting and locking the movable section to the fixed section.

5. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor, a plate pivotally supported by the transom, yieldable means to hold the plate upright, a power transfer device traversing the transom and supported by the said plate, means to operatively attach the motor to the inboard end of the power transfer device, means to support the motor by the plate, a propeller drive unit operatively connected to the outboard end of the power transfer device, said drive unit comprising a fixed section and a movable section, pivot means rotatably carried by the fixed section and attached to the movable section whereby the said movable section can swing and rotate independently of the motor, a driving shaft in the fixed section coupled at one end to the power transfer device, a vertical propeller shaft within the movable section, a disengageable power drive coupling between the said shafts, and means including a spring loaded slidable sleeve for moving the power drive coupling to engage the said shafts and operatively connecting and locking the movable section to the fixed section, and trigger means carried by the propeller drive unit and connected to the slidable sleeve to release the said sleeve and unlock the movable section.

6. A motor boat drive mechanism according to claim 5 in which the slidable sleeve and power drive coupling comprises, a slidable splined driving shaft, an internal gear on the lower end of said shaft, a vertical shaft underlying the driving shaft, a gear on the underlying shaft engageable with the internal gear on the sliding shaft, a spring loaded slidable sleeve fitting over a tubular portion of the fixed section of the propeller drive unit, an annular flange within the said sleeve, means to engage the said flange with the sliding shaft and a tubular portion on the movable section in alignment with the fixed section.

7. A motor boat drive mechanism according to claim 3 in which the trigger means comprises an arm, an arcuate segment pivotally secured at one end of the arm, said

segment being swingably fastened to the housing of the fixed section, a loading platform on the slidable sleeve underlying the free end of the segment, a transom contacting member on the free end of the arm and a detent extending from the secured end of the segment to bring the free end of the segment in contact with the loading platform during the operating cycle of the drive mechanism.

8. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor, a plate pivotally secured to the stern transom inboard thereof and constituting a first fulcrum point, yieldable means to hold the plate upright, means to support the motor by the plate, a propeller drive unit outboard of the stern transom operatively connected to the motor and supported by the plate, said unit consisting of a fixed section and movable section, pivot means rotatably carried by the fixed section and attached to the movable section securing the movable section to the fixed section so as to swing and rotate independently of the motor, said pivot means forming a second fulcrum point, and means including a spring loaded slidable sleeve for operatively connecting and locking the movable housing to the fixed housing.

9. A motor boat drive mechanism according to claim 5 in which the yieldable means holding the plate upright consists of a spring, an enclosure for the spring, means to fasten the enclosure to the transom, a rod connecting the plate to a flanged member bearing against the spring, and means consisting of a series of spaced holes in the rod for selective coupling to a hole in said flanged member for adjustment of the plate position.

10. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor, a plate pivotally secured to the stern transom inboard thereof and constituting a first fulcrum point, means to support the motor by the plate, a propeller drive unit outboard of the stern transom operatively connected to the motor and supported by the plate, said unit consisting of a fixed section and movable section, pivot means rotatably carried by the fixed section and attached to the movable section whereby the movable section is secured to the fixed section so as to swing and rotate independently of the motor, said rotatable pivot means comprising a cap member journaled to the fixed section and pivot means on said cap member forming a second fulcrum point, and means including a spring loaded slidable sleeve for operatively connecting and locking the movable housing to the fixed housing.

11. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor secured to the stern transom so that a portion of said motor extends through the transom, a propeller drive unit operatively connected to the motor outboard of the transom, said drive unit consisting of a fixed section and movable section, rotatable pivot means on the fixed section securing the movable section thereto, whereby the movable section can swing and rotate independently of the motor, said rotatable pivot means consisting of a collar type bearing freely journaled to the fixed section, spaced arms pivotally secured at one end to the said bearing and firmly attached to the movable section at the other ends, and means including a spring loaded slidable sleeve for operatively connecting and locking the movable section to the fixed section.

12. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a motor secured to the stern transom so that a portion of said motor extends through the transom, a propeller drive unit operatively connected to the motor outboard of the transom, said drive unit consisting of a fixed section and movable section, pivot means rotatably secured to the fixed section and attached to the movable section whereby the movable section is secured to the fixed section so as to swing and rotate independently of the motor, said rotatable pivot

means consisting of a collar-type bearing freely journaled to the fixed section, spaced arms pivotally secured at one end to the said bearing and firmly attached to the movable section at their other ends, means including a spring loaded slidable sleeve for operatively connecting and locking the movable section, and a quick release mechanism comprising a trip arm pivotally secured to the propeller drive unit and extending in front thereof, a trigger member between the drive unit coupling and motor, and a linkage between the said trip arm and trigger member adapted to disconnect and release the movable section from engagement with the fixed section.

13. A drive mechanism according to claim 12 in which the trigger member comprises two spaced arms, an arcuate segment on each of said arms pivotally secured to the fixed section of the drive unit, a loading platform on the sliding locking sleeve underlying the free end of each segment so as to restrain the spring loaded sleeve, an arcuate track joining the said segments and lying in a horizontal plane, a rod underlying the said track, an underwater trip arm engageable by the rod, and spring means for returning and holding the linkage in position.

14. A motor boat drive mechanism for attachment to the stern transom of a boat comprising a support bracket pivotally secured to the outboard side of the transom, a motor and propeller drive unit attached to said bracket, said propeller drive unit consisting of a fixed section and a movable section, rotatable pivot means on the fixed section securing the movable section thereto so as to swing and rotate independently of the motor, said rotatable pivot means consisting of a collar bearing freely journaled to the fixed section, spaced arms pivotally secured at one end to the said bearing and firmly attached to the movable section at the other end, a half bearing on the

lower portion of the support bracket in contact with the drive section for absorbing propeller thrust, a yieldable impact absorbing member between the bracket and transom holding the said bracket in an upright position, and a spring loaded slidable sleeve for operatively connecting and locking the movable section to the fixed section.

15. A motor boat drive according to claim 14 in which the impact absorbing member comprises a spring, an enclosure for the spring, means to fasten the enclosure to the transom, a rod connecting the bracket to a flanged member bearing against the spring, and means consisting of a series of spaced holes in the bracket, any one of which may be selectively placed in register with a hole in the rod, and a clevis pin receivable in said holes to join the said rod and bracket together so as to obtain the desired tilt adjustment of the bracket.

16. A motor boat drive mechanism for attachment to the stern transom of a boat comprising, a top and bottom motor secured to the stern transom and disposed one above the other and having their crankshafts extending in a vertical position, a power transfer device common to both motors and connected thereto, a single propeller drive unit comprising a fixed section and a movable section supported by the said power transfer device, rotatable pivot means on the fixed section securing the movable section thereto so as to swing and rotate independently of the motors, and means including a slidable sleeve for operatively connecting and locking the movable section to the fixed section.

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