Dec. 9, 1941. G. J. BUCK 2,265,625

DETACHABLE TROLLING PLATE FOR OUTBOARD MOTORS

Filed June 12, 1940 2 Sheets-Sheet 1

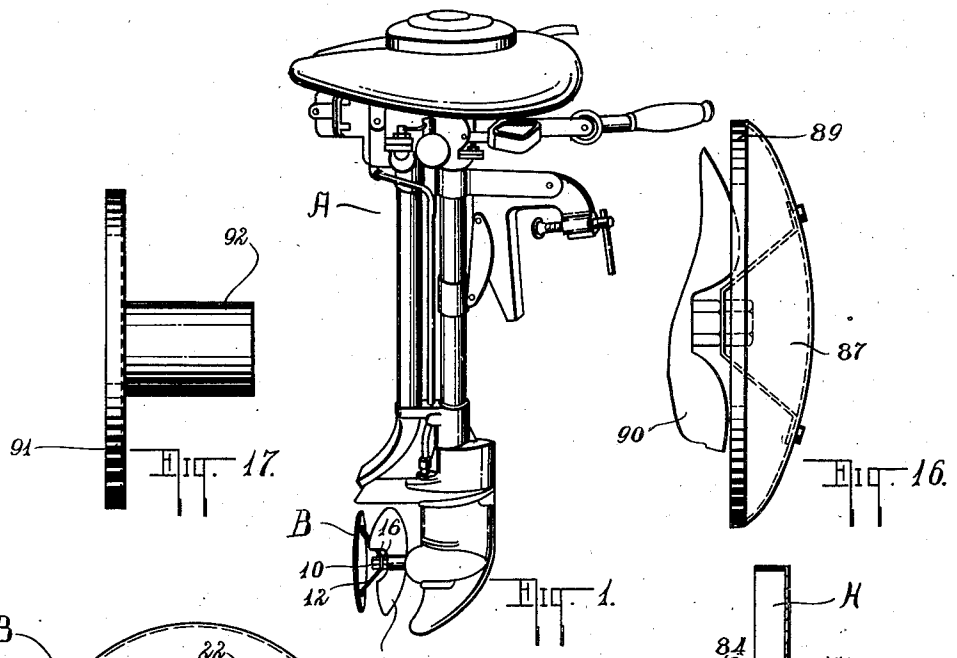


Fig. 17. Fig. 16. Fig. 1.

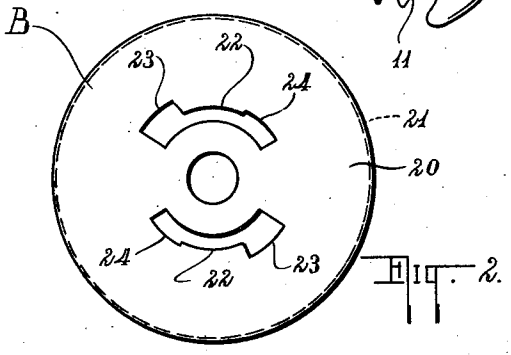


Fig. 2.

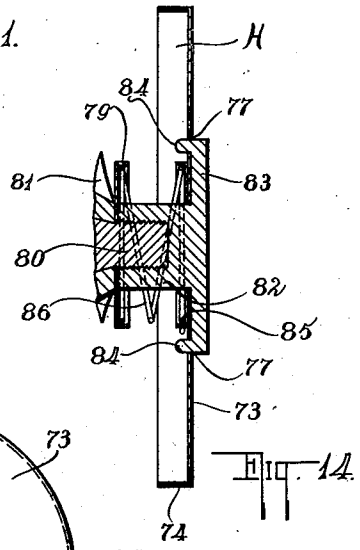


Fig. 14.

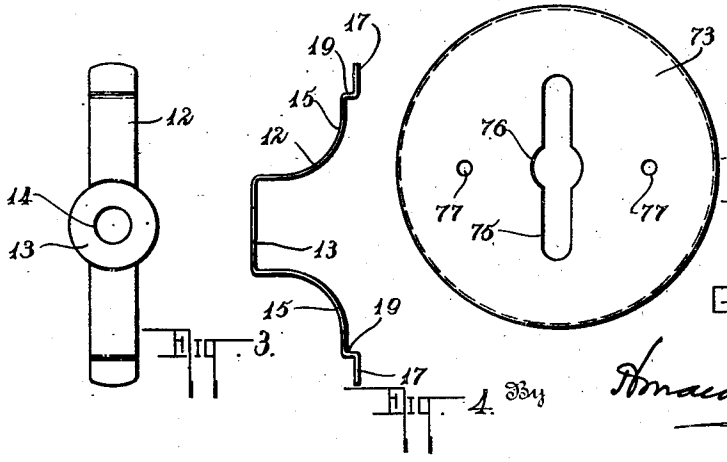


Fig. 3. Fig. 4. Fig. 15.

Inventor
GEORGE J. BUCK

By Howard L. Fischer
Attorney

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DETACHABLE TROLLING PLATE FOR OUTBOARD MOTORS

Filed June 12, 1940 2 Sheets-Sheet 2

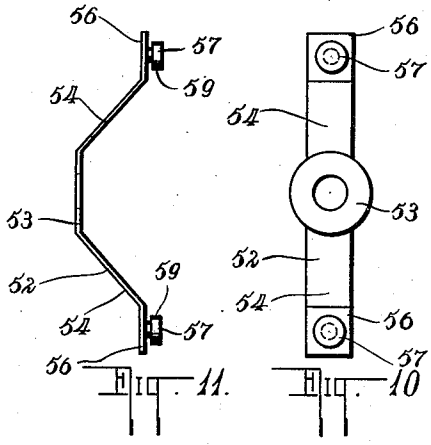


Fig. 11.

Fig. 10.

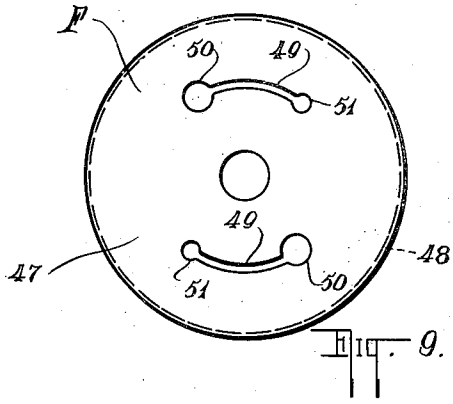


Fig. 9.

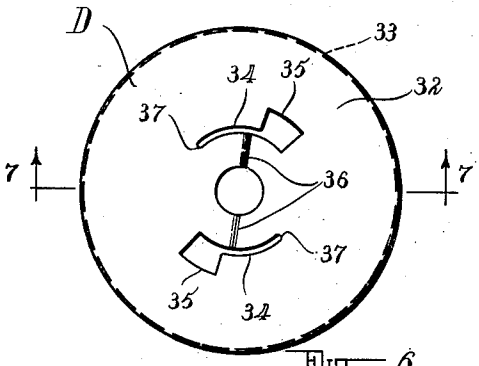


Fig. 6.

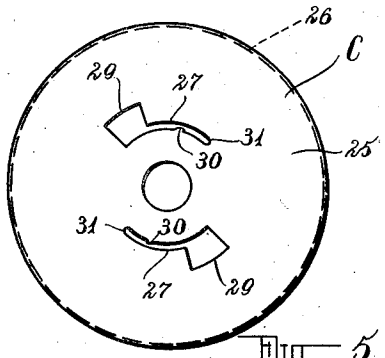


Fig. 5.

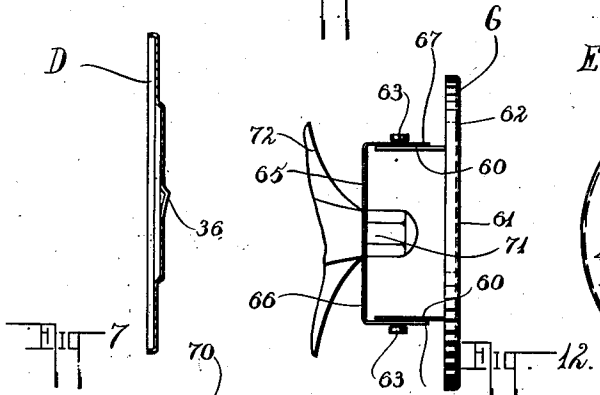


Fig. 7. Fig. 12.

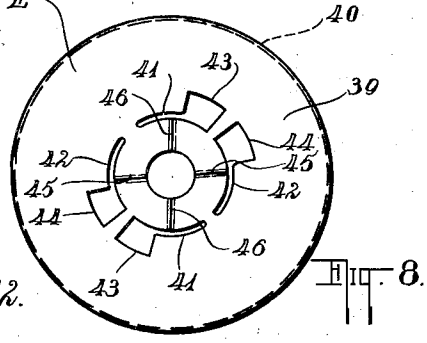


Fig. 8.

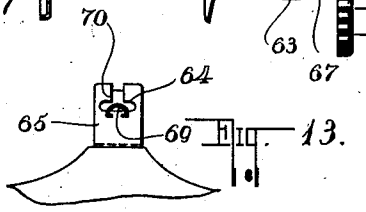


Fig. 13.

Inventor
GEORGE J BUCK

By Howard L. Fischer
Attorney

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UNITED STATES PATENT OFFICE

2,265,625

DETACHABLE TROLLING PLATE FOR OUTBOARD MOTORS

George J. Buck, Minneapolis, Minn., assignor of one-third to Robert G. Peterson and one-third to Harry C. Whitmore, both of Minneapolis, Minn.

Application June 12, 1940, Serial No. 340,102

13 Claims. (Cl. 170—135)

My invention relates to a detachable trolling plate for outboard motors wherein it is desired to provide an attachment for motors of this type which may be quickly and easily detachable and which may be used to slow the effective speed of the boat propelled by the motor.

Outboard motors are usually constructed with one or two cylinders and present day outboard motors are so constructed that they can travel at a relatively low rate of speed. However, if the speed of the motor is reduced below a certain predescribed minimum the motor will stall because of the slow speed of rotation of the crank shaft. These motors are made to travel as efficiently as possible and are constructed to give a considerable amount of speed when it is so desired. When it becomes necessary to travel at an extremely low rate of speed, some provisions have to be made in order to prevent the motor from stalling.

It is the object of the present invention to provide a speed reducing means in the form of a disc secured concentric with the propeller rotated by the motor and detachably mounted adjacent the propeller. This disc is arranged to rotate with the propeller but to deflect the water thrown rearwardly by the propeller in such a way that a portion of the effectiveness of the propeller is counteracted. Thus by reducing the speed of the motor and using this disc adjacent the motor propeller, the speed of travel of the boat may be reduced without danger of stalling the motor.

It is a feature of my invention to provide a trolling disc which is engageable with a rotating bracket permanently secured adjacent the propeller. Thus by tilting the motor upwardly, the trolling disc or plate may be attached to this bracket without difficulty and this action may be accomplished while the boat is out upon the water without endangering the occupants of the boat. It is highly desirable to provide a disc of this sort as easily and effectively attachable and removable as possible, as otherwise it is necessary either to leave the trolling plate in place all the time or else to put in to land in order to apply the plate. As fishing grounds are often encountered at a considerable distance from the starting point of the boat, the constant use of a trolling disc of this type is undesirable and as these fishing grounds often occur near sand bars or the like, at a considerable distance from shore, it is extremely convenient to provide a plate which may be easily and simply attached while the boat is on the water.

It is a further purpose of my invention to provide a bracket which constantly rotates with the driven propeller to which the disc may be attached. In attaching my trolling disc or plate it is only necessary to insert the disc or plate in proper relation to the bracket and to rotate the disc into its proper position.

It is a further feature of my invention to provide a disc or plate provided with a sealed compartment or float so that should the disc be accidentally dropped into the water, this member will float on the surface so that it may be recovered.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of this specification:

Figure 1 is a perspective view of an outboard motor with the trolling plate attached thereto.

Figure 2 is an elevational view of a trolling disc in readiness for attachment.

Figure 3 is a front elevational view of the bracket which is attached to the propeller shaft of the motor to which the trolling disc may be secured.

Figure 4 is a side elevational view of the bracket illustrated in Figure 3.

Figure 5 is an elevational view of a modified form of construction of trolling disc.

Figure 6 is an elevation view of a slightly different form of construction from that illustrated in Figure 5.

Figure 7 is a sectional view on the line 7—7 of Figure 6.

Figure 8 is a view similar to Figures 6 and 7, but showing the plate adapted for attachment and showing the disc operable upon a propeller rotating in either direction.

Figure 9 is an elevation view of a modified form of construction of trolling disc.

Figure 10 is an elevation view of the bracket used in conjunction with the disc illustrated in Figure 9.

Figure 11 is a side elevation view of the bracket shown in Figure 10.

Figure 12 is a side elevation view of a modified form of construction of trolling disc.

Figure 13 is a detail view of the attaching bracket for the disc illustrated in Figure 12.

Figure 14 is a cross-sectional view through a modified form of disc and attaching means.

Figure 15 is an elevation view of the disc used in Figure 14.

Figure 16 illustrates a modified shape of disc

which may be used in place of the shapes previously illustrated.

Figure 17 illustrates a disc having a float attached thereto. Such a float may be used with any of the originally described discs.

The outboard motor A may be of any desired or preferred type which causes rotation of a propeller shaft 10 and the propeller 11 mounted thereupon. The trolling disc B is secured to the propeller shaft 10 by means of a bracket 12 best illustrated in Figures 3 and 4 of the drawings. This bracket 12 is provided with a central bearing plate 13 having an opening 14 therethrough, and this bearing plate 13 is provided with oppositely disposed resilient arms 15 extending rearwardly and outwardly from the propeller 11. The propeller shaft 10 is designed to fit through the opening 14 and the bracket 12 is attached to the bracket 10 by means of lock nuts 16.

Each of the resilient arms 15 are provided with offset ends 17 which are connected to the remainder of the arms by radially extending connecting portions 19. These connecting portions 19 are at least the thickness of the disc B in order that the bracket 12 may extend through this disc. The trolling plate B in one form of its construction is illustrated in Figure 2 of the drawings. This view discloses a circular plate-like body 20 having a marginal flanged edge 21 thereupon. Arcuated slots 22 are provided concentric with the disc 20. The width of the slots 22 is increased at one end 23 to such an extent that the offset ends 17 may fit through the enlarged portion of the slot. The slots 22 are also enlarged at their other end 24, the remainder or central portion of the slot 22 being of slightly less diameter than the distance between the connecting portions 19 on the bracket 12.

In applying the disc B the offset ends 17 are extended through the enlarged apertures 23 at the ends of the slots 22. The disc B is then rotated with respect to the bracket, it being necessary to compress the arms 15 together slightly in order to have the connecting portions 19 pass within the slots 22 as these connecting portions 19 are a slightly greater distance apart than the distance between the outer extremities of the slots 22. Upon rotation of the disc B the bracket 12 comes into communication with the enlarged portions 24 of the slots 22, the arms 15 of the bracket then springing outwardly and urging the connecting portions 19 into the enlarged portions 24. When in this position the disc B cannot be rotated in either direction without compressing the arms 15 of the bracket together slightly. As there is no force capable of springing these arms together accidentally, the disc B will remain attached until removed by hand.

In Figure 5 of the drawings I disclose a form of of construction virtually identical with that illustrated in Figure 2. In this form of construction the disc C is in the form of a circular plate or body 25 having a peripheral rim 26 extending thereabout. A pair of arcuated slots 27 are provided concentric with the disc-shaped body 25 and enlargements 29 are formed in this disc to permit the passage of the offset ends 17 of the bracket 12 to pass therethrough.

A cam-shaped shoulder 30 is provided in each of the slots 27 which engages the connecting portions 19 of the bracket 12 during rotation thereof relative to the disc, springing the arms 15 apart to some extent as the connecting portions pass over the shoulders 30. As the arms 15 are pivoted toward the ends 31 of the slots 27 opposite the enlarged ends 29, the arms 15 spring inwardly and are held in place by the cam shoulders 30.

In Figures 6 and 7 of the drawings I disclose a trolling plate D which is very similar to the plates B and C. In this form of construction the circular body 32 is provided with a peripheral flange 33 and with arcuated slots 34 concentric with the disc-shaped body 32. The slots 34 are enlarged in width at 35 in order that the offset ends 17 of the bracket 12 may be inserted therethrough. The slots 34 are designed to accommodate the connecting portions 19 when the disc is rotated from its first position, the offset ends 17 overlying one surface of the disc, while the portion of the arms 15 adjacent the connecting portions 19 overlie the opposite surface of these brackets.

The surface of the disc 32 adjacent the slots 34 is deformed to provide shoulders engageable with the resilient arms 15. As may be seen in Figures 6 and 7 of the drawings, shoulders 36 are provided adjacent the inner edge of the slots 34, which shoulders are engageable with those portions of the spring arms 15 closely adjacent the connecting portions 19 of these arms. Thus after the offset ends 17 of the brackets 12 have been inserted through the enlarged portions 35 of the slots 34, rotation of the disc D with respect to the bracket causes the bracket arms 15 to flex over the shoulders 37 and to engage in the slots 34 against the shoulders 36. Rotation of the disc D with respect to the bracket is then limited in one direction by the ends 37 of the slots 34 and in the other direction by the shoulders 36. The disc D may be removed, however, by flexing the arms 15 or plate D sufficiently to rotate the bracket 12 over the shoulders 36.

In Figure 8 of the drawings, I disclose a construction virtually identical to that illustrated in Figures 6 and 7, which, however, is adapted for use in connection with a propeller traveling in either diretcion. In this form of construction illustrated in general by the numeral E, the disc-shaped body 39 is provided with a peripheral edge 40. Two sets of arcuated notches 41 and 42 are provided which are concentric with respect to the body 39. The notches 41 are provided with enlarged apertures 43 communicating with one end thereof, while the notches 42 are provided with enlarged apertures 44 communicating with the other extremity thereof. These enlargements are designed to accommodate the offset head end portions 17 of the brackets 12, which brackets may be rotated into the slots 41 or 42, the connecting portions 19 extending through these slots so that the offset head ends 17 overlie the rear surface of the disc E, while the bracket arms 15 adjacent the connecting portions 19 overlie the front surface thereof.

Shoulders 45 are provided adjacent the slots 42 to frictionally engage the brackets 15 and to hold these brackets in the slots 42 after the disc E has been attached. Similar shoulders 46 are provided adjacent the slots 41 so that the bracket 12 may be held in the slots 41. Obviously the slots 41 are designed for use when applied to motors having propellers operating in one direction, while the slots 42 are designed to engage the bracket 12 on motors where the propeller is operating in the opposite direction.

In Figures 9, 10, and 11 of the drawings, I disclose a plate and bracket construction which is slightly different from that previously described. The type of trolling plate F illustrated in Figure 9 is disclosed having a circular body 47 with a peripheral flange 48 extending thereabout. A pair of concentric arcuated slots 49 are provided in the plate 47 and concentric therewith. The slots

49 are provided with an enlarged end 50 thereupon in diametrically opposed relation and a pair of smaller enlargements 51 at the other end thereof.

The bracket 52 illustrated in Figures 10 and 11 include a central bearing portion 53 having a pair of oppositely disposed bracket arms 54 projecting therefrom and having aligned ends 56 secured thereto. Studs 57 are provided in the ends 56 having enlarged heads 59 by means of which the bracket may be secured to the disc body 47.

In operation the heads 59 of the studs 57 are inserted through the enlarged ends 50 of the slots 49 and the circular body 47 is rotated with respect to the bracket 52 so that the shanks of the studs 57 pass through the slots 49. The slots 49 may be spaced slightly farther apart from the center of the disc or closer to the center of the disc than the studs 57 so that the shanks of the studs engage an edge of the slots 49 under spring tension. When the disc body 47 has been rotated until the shanks of the studs 57 engage in the slightly enlarged ends 51 of the slots 49, this spring tension decreases and the disc remains in this set position.

In the type of construction illustrated in Figures 12 and 13, the trolling plate G is of the same general form as has been previously illustrated and is provided with a pair of rearwardly extending parallel brackets 60. These brackets are secured to the rear surface of the substantially circular plate 61 having a marginal rim 62. The brackets 60 are equipped with studs 63 having enlarged heads as illustrated. These heads are designed to fit into a T-shaped slot 64 in a substantially U-shaped bracket 65 having a base portion 66 and a pair of substantially parallel sides 67. The T-shaped slot 64 is best illustrated in Figure 13 of the drawings and is shown with a spring 69 embedded therein which is engageable against the shanks of the studs 63. In inserting the trolling plate G upon the bracket 65 the plate 61 is forced toward the bracket 65, the studs 63 entering the longitudinally extending slot portion 70 of the T-shaped slot 64 until these studs engage the springs 69. The springs are compressed by further inward movement of the studs and when the studs reach the base of the T-shaped slot 64 the plate may be rotated in either direction to position the studs on one side or on the other of the entrance slot 70. The spring 69 holds the studs resiliently in the chosen position and the operator rotates the disc in the opposite direction of rotation of the propeller so that there is no tendency for the rotation of the disc to disengage the same from the bracket 65. The bracket 65 is secured by the nut 71 to the propeller shaft adjacent the motor propeller 72.

In Figures 14 and 15 of the drawings I disclose another modified form of construction. In this construction the trolling plate indicated in general by the letter H is provided with a substantially circular body 73 having a peripheral rim 74 thereupon. The plate 73 is provided with a slot 75 extending outwardly from the center thereof an equal distance in each direction, and an enlarged opening 76 may be provided in the center of the plate for accommodation of the hub of the holding means. At right angles to the longitudinal axis of the slot 75 I provide a pair of spaced apertures 77 through the plate for a purpose which will be later more clearly described.

With reference to Figure 14 of the drawings it will be noted that a washer 79 encircles the propeller shaft 80 adjacent the propeller 81 and a nut 82 screws onto the propeller shaft 80 to hold the washer 79 in fixed position. This nut 82 is provided with a cross member 83 thereupon designed to fit within or pass through the slot 75 in the plate-like body 73. The ends of the cross member 83 are provided with a pair of forwardly extending projections 84 which are designed to engage in the apertures 77 in the body 73. A second washer 85 is positioned encircling the nut 82 adjacent the cross member 83 and a spring 86 is interposed between the washers 79 and 85.

In operation the washers 79 and 85, the spring 86, and the nut 82 including the cross member 83 and the projections 84, remain permanently affixed to the propeller shaft 80. When it is desired to secure the trolling plate H in position it is only necessary to position the body 73 so that the slot 75 is placed in juxtaposition with the cross member 83 and to press the plate inwardly compressing the spring 86 and sliding the washer 85 longitudinally of the nut 82. When the plate-like body 73 has been forced inwardly sufficiently so that the projections 84 clear the outer surface or the rear surface of the body 73, this body or plate may be rotated 90° until the projections 84 on the cross member 83 coincide with the apertures 70. Inward pressure upon the plate may then be released and the projections extend through the apertures 77 to hold the plate 73 from rotation relative to the nut 82 and accordingly with respect to the propeller shaft 80.

In Figure 16 of the drawings, I disclose a plate 87 which is concave in shape and is provided with a marginal rim 89 as illustrated. This plate 87 may be substituted for any of the various flat plates which have been disclosed in the previous drawings. This concaved shape tends to form a water pocket which slows the speed of the boat to a greater extent than will be accomplished with a flat plate. The propeller 90 positioned adjacent the plate 87, forces water against this plate and the curvature of the plate tends to urge this water forwardly, thus reducing the efficiency of the propeller to a considerable extent.

In Figure 17 of the drawings I disclose a plate 91 which may be any of the plates previously described and disclose attached thereto a float 92. This plate may be a lighter member than water and of sufficient size to cause the entire plate to float if released in the water. If it is desired, the float 92 may be a hollow container filled with air or suitable material so that should the plate be accidentally dropped in the water, it will float on the surface and may be readily recovered.

In accordance with the patent statutes I have described the principles of construction and operation of my trolling plate, and while I have endeavored to disclose the best embodiments thereof, 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 retarding device for propellers comprising a bracket including radially extending arms secured for rotation with said propeller, a plate having a series of arcuate slots therein, enlargements at one end of each of said slots, and fastening means on said brackets comprising shank

means engageable through said slots and heads on said shank means engageable through the enlarged portions of said slots.

2. A retarding device for propellers comprising a bracket secured for rotation with the propeller having a series of radially extending arms thereupon, head portions formed on the ends of said arms, a retarding plate having a series of arcuate slots therein, enlarged portions in said slots through which said head portions may extend, and shoulders in said slots engaging said head portions to prevent accidental disengagement thereof.

3. A retarding device for propellers comprising a bracket secured for rotation with the propeller, said bracket comprising a series of radially extending resilient arms, having head ends thereon a disc having a series of arcuate slots therein, enlarged portions in said slots through which said head ends may extend, said bracket being movable through said slot under spring tension, and shoulders in said slots engaged by said head ends to prevent accidental disengagement of said disc from said bracket.

4. A retarding device for propellers comprising a resilient bracket attached to the propeller for rotation therewith, said bracket having oppositely disposed arms, head ends on said bracket, a disc having arcuate slots therein, an enlarged portion in each of said slots through which said head ends of said bracket may extend, and cam means adjacent said slots for flexing the arms to resist accidental disengagement of said disc from said bracket.

5. A retarding device for propellers comprising a bracket secured for rotation with the propeller, a retarding disc, spaced brackets on said disc, and means on said spaced brackets engageable with said first named bracket to detachably secure said disc to said first named bracket.

6. A retarding device for propellers comprising a bracket secured for rotation with the propeller, a disc having an aperture therethrough through which a portion of said bracket may extend, spring means urging said disc against said bracket, and co-operable means on said bracket and said disc for holding said disc against rotation with respect to said bracket.

7. A retarding device for propellers comprising a disc means, means for removably securing said disc to said propeller shaft, and float means secured to said disc means whereby said disc means will be caused to float should the same be disengaged from said propeller.

8. A retarding device for propellers comprising a bracket secured for rotation with said propeller, said bracket having offset portions at its ends, a disc in spaced relation to said propeller provided with arcuate slots, each of said slots having an enlarged section through which one of said offset portions of said bracket may be inserted during assembly, the narrower part of said slot cooperating with said offset portion, after the disc is rotated during assembly, for securing said disc to said bracket.

9. A retarding device for propellers comprising a bracket secured for rotation with said propeller, said bracket having offset portions at its ends, a disc in spaced relation to said propeller provided with arcuate slots, each of said slots having an enlarged section through which one of said offset portions of said bracket may be inserted during assembly, the opposite end of said slots having an opening of smaller area than said enlarged section and cooperating with said offset portion, after the disc is rotated during assembly, for securing said disc to said bracket.

10. In combination, a marine propeller, a shaft therefor, a retarding disc, an annular flange about the periphery of said disc extending a sufficient distance therefrom on the forward side of said disc to form a substantial pocket therewith, a support fixed to said shaft, and means for releasably securing said disc to said support.

11. In combination, a marine propeller, a shaft therefor, a retarding disc concaved on the forward side thereof to form a substantial pocket, a support fixed to said shaft, and means for releasably securing said disc to said support by moving the disc relative to said shaft.

12. In combination, a marine propeller, a shaft therefor, a retarding disc, an annular flange about the periphery of said disc extending a sufficient distance therefrom on the forward side thereof to form a substantial pocket therewith, a support fixed to said shaft, and means for releasably securing said disc to said support by moving the disc axially of said shaft into engagement with said support and then rotating said disc into locking position.

13. In combination, a marine propeller, a shaft therefor, a retarding disc concaved on the forward side thereof to form a substantial pocket, a support fixed to said shaft, means for releasably securing said disc to said support by moving the disc relative to said shaft into engagement with said support and then rotating said disc into locking position.

GEORGE J. BUCK.

CERTIFICATE OF CORRECTION.

Patent No. 2,265,625. December 9, 1941.

GEORGE J. BUCK.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, first column, line 17, claim 3, after the word "arms" strike out the comma and insert the same after "on", line 18, same claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of January, A. D. 1942.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)