Sept. 13, 1966 M. KORCAK 3,272,171

LANDING CONTROL AND EMERGENCY STEERING DEVICE FOR WATER CRAFT

Filed March 31, 1965

Fig. 1

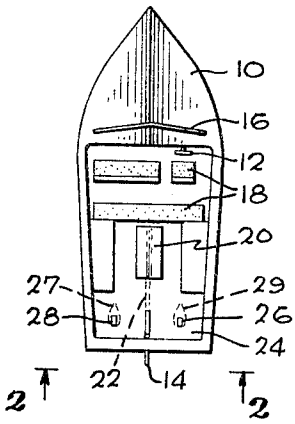


Fig. 2

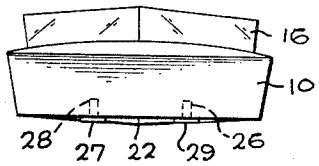


Fig. 3

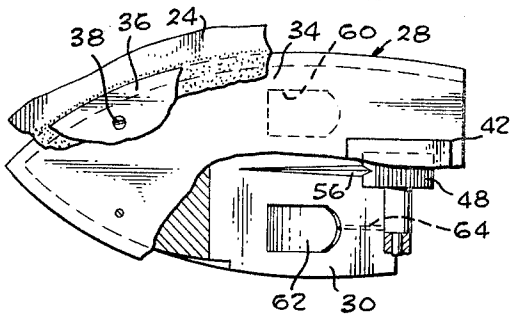


Fig. 4

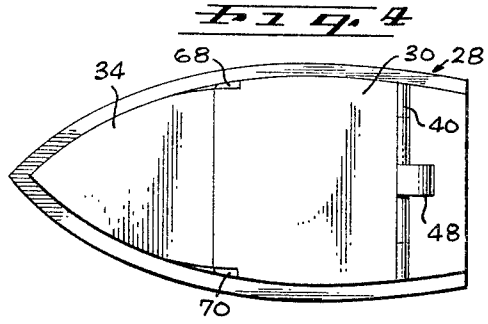


Fig. 5

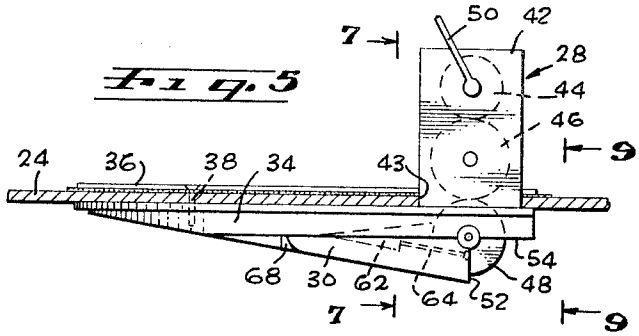


Fig. 6

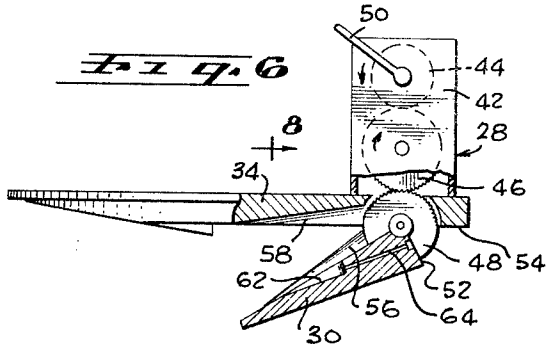


Fig. 7

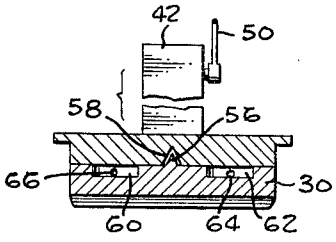


Fig. 8

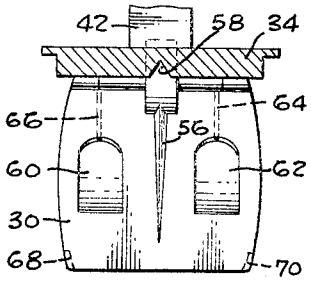
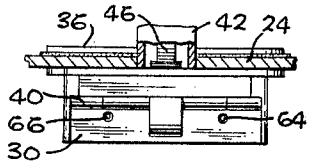


Fig. 9



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LANDING CONTROL AND EMERGENCY STEERING DEVICE FOR WATER CRAFT

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10 Claims. (Cl. 114—145)

This invention relates to a landing control and emergency steering device for water craft, such as ships, boats, hydroplanes and the like. More particularly it relates to a steering device affixed to the bottom of a small boat or similar craft wherein movable vanes are made to go into and out of the fluid path of the craft to give it directional control at very slow speeds.

Today most small powered craft are guided through the water by means of one or more rudders which divert the water flowing past them to one side or the other as the boat is in motion. These rudders are normally located at or near the aft end of the craft and serve to swing the stern around to point the craft in the desired direction.

This rudder deflection type of steering control is most effective when the craft is in motion, but as the craft slows down or stops, it very rapidly loses its effectiveness. At the very time when steering control may be most sorely needed, that is at very low speeds, as when maneuvering in close quarters or in landing, the conventional rudder system is the least effective.

In one form of steering device using the principles of the present invention, a pair of modular bases are attached to the bottom of the hull of the craft near its stern, one on each side of its keel. The low, smooth profile of the bases does not increase the drag of the hull appreciably. Each base is constructed so that a portion of its underside forms a vane which may be rotated between its fully retracted streamline position and its fully extended drag or braking position. Each of the vanes may be operated independently of the other. If one is lowered it operates to turn the craft. The greater the speed of the craft, naturally, the greater the turning effect; however, it has been found that turning is accomplished by proper use of the single vane even at a dead stop. If both vanes are lowered simultaneously to increase drag, the craft's forward speed will be arrested very quickly; and if they are left in the extended position, they achieve a "sea anchor" effect, which is found very useful in heavy seas or when the craft's power has been lost.

In addition to the steering control and effective braking and stabilizing achieved, in this form the invention also has a salutary effect on the operation of the craft itself. With the vanes fully retracted, the lower surfaces of the bases present a wedge-shaped configuration which tends to raise the stern of the craft higher in the water, with the nose settling lower, than similar craft without such a device. This leveling effect occurs at a lower speed and thus improves the overall performance and efficiency of the craft.

An object of the present invention is to provide effective steering control means for water craft travelling at slow speeds.

Another object is the provision of a steering control mechanism that may be easily attached to existing water craft.

Another object is the provision of a steering control mechanism that is hydrodynamically streamlined when not in use.

Another object is the provision of a steering control mechanism which is simple and inexpensive to construct, easy and efficient to operate, and which is durable without requiring substantial maintenance.

Other objects will become more apparent as the description of the invention proceeds, having reference to the drawings wherein:

FIGURE 1 is a plan view of a craft using the steering device of this invention;

FIGURE 2 is a rear view, taken along line 2—2 of FIGURE 1;

FIGURE 3 is a plan view with parts broken away of one steering device attached to the bottom of the craft;

FIGURE 4 is a view of a steering device as seen from its bottom;

FIGURE 5 is an elevational view showing a steering device mounted to the craft;

FIGURE 6 is an elevational view with parts broken away, showing one form of actuation;

FIGURE 7 is an elevational view taken along the line 7—7 of FIGURE 5;

FIGURE 8 is an elevational view taken along the line 8—8 of FIGURE 6; and

FIGURE 9 is an elevational view taken along the line 9—9 of FIGURE 5.

Referring now to FIGURE 1 there is shown, in plan view, a typical small water craft **10**, such as a motorboat with an inboard motor for example. Generally such a craft has a steering wheel **12** which operates a rudder **14** which gives the craft directional control while it is under way. Typically, the faster the speed of the boat, the better will be its steering control. A windshield **16**, and seats **18**, add to the comfort of the passengers. A motor housing **20** contains the powerplant, not shown, for the craft. This housing and powerplant typically are positioned above the keel **22**, which usually defines the axis along which may be found the center of gravity of the craft. Mounted through the hull **24** of the craft, one on each side of keel **22**, are identical steering devices **26**, **28**. Shown in dotted lines are the outlines of the portions **27**, **29** of devices **28**, **26**, respectively, which extend under the hull **24** of the craft. As can be seen in FIGURE 2 the portions **27** and **29** are streamlined and form a very low profile with the bottom of the boat.

Since devices **26** and **28** are identical the following description, though limited to one of them will apply equally to both.

As best shown in FIGURES 3, 4, 5 and 6, steering device **28** comprises a hydrodynamically streamlined base **34** adapted to be mounted on the bottom of hull **24**. A metal cover plate **36** fits inside the hull **24** to permit fastening means **38**, such as nuts and bolts, screws, rivets or the like, to extend therethrough and securely retain the base **34** to the hull **24** without danger of the fastening means **38** being pulled through the hull, or the hull itself being damaged. The base **34** is provided with a transverse hinge **40** near its rear end to hingedly mount a vane **30** so as to permit vane **30** to lie flat against the underside of the base **34** when retracted, and to rotate downwardly through an angle of approximately 90° about the hinge **40** when it is extended.

Above hinge **40** is a gear housing **42** of box-like construction which fits through an appropriate opening **43** in the boat hull **24**. This housing contains suitable gears **44** and **46** to engage gear **48** on hinge **40**. Connected to gear **44** is a shaft or handle **50** which may be electrically, manually or hydraulically actuated to raise and lower vane **30**. Since water can leak past hinge **40** and into housing **42**, the housing is made water-tight to protect the integrity of the craft. A water-tight sealant is also placed around the housing and within the opening **43**.

As can be seen in FIGURES 5 and 6, base **34** and vane **30** have a forward taper, toward the left in these views, in order to have a streamline effect and not create drag

as the craft upon which they are mounted moves through the water. However, upon the slightest opening between the vane **30** and base **34** a scoop is formed against which the water is forced. This force, in turn, tends to aid in the opening operation, thereby reducing the amount of force which must be supplied by further operation of the shaft or handle **50**. The end **52** of vane **30** cushions against the lower surface **54** of the base **34** near its rear end when the vane is in its fully extended position. This cushioning effect on the last portion of the opening movement is enhanced by a novel ducting system extending through the vanes. This system consists of recesses **60**, **62** on the upper surface of the vane **30** with rearwardly extending passages **64**, **66** communicating through the rear end of the vane. Forward movement of the craft causes water to be scooped up by the recesses **60**, **62** and passed under increased pressure through passages **64**, **66**. As the end **52** of vane **30** approaches the surface **54**, the cushioning effect of the rapidly moving water escaping through passages **64** and **66** increases, thus permitting the vane **30** to be extended without damage to the craft, even at relatively high speeds.

FIGURES 7, 8 and 9, in addition to FIGURES 3, 5 and 6, show additional refinements in the steering device. One such feature is that of preventing debris in the water from fouling the vane and preventing its closure. This is done with the tapered reinforcing rib **56** on the upper surface of the vane **30**. This rib may be sharpened to cut through trapped seaweed, kelp, etc. while vane **30** is in its extended position. Groove **58** in the base **34** receives the rib **56** and facilitates this cutting operation when the vane **30** is retracted to its streamlined configuration.

As previously mentioned, a slight opening between the base **34** and vane **30** might cause the vane to extend fully without appreciable additional force on the handle shaft **50**. To keep this slight opening from occurring, and to counteract the adverse effect of such an opening should it occur accidentally, the ducting system earlier described holds the vane **30** against the base **34** by a low pressure seal. As previously mentioned, recesses **60** and **62** have rearwardly extending passages **64**, **66** communicating through the vane **30**, with the relatively rearward flow of water as the craft moves forwardly. This movement tends to draw water from recesses **60**, **62** and thus effect a tighter seal. Further, the rounded corners **68**, **70** continually urge the retracted vane into abutting contact with the base.

The ducting system also facilitates retraction of the vane when the craft is moving. As water is scooped up by the recesses **60**, **62** and passed through passages **64**, **66**, it impinges upon base edge **54**, causing vane **30** to initiate its forward movement, breaking any seal that might exist between the rear end of the vane and the base.

In operation, in the event of the failure of the conventional steering mechanism of the craft, or in the event of the inability of the steering mechanism to function properly as when the craft is moving at very slow speeds, or in shallow or confined water, braking action may be provided by extending the vanes of both of the laterally mounted devices, and steering may be accomplished by extending only one of them. Repeated extension and retraction of one of the vanes, or the alternate repetitive extension and retraction of both of them will facilitate directional control, even at a dead stop.

The foregoing description of one embodiment is to be considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents falling within the scope of the invention as claimed are intended to be included herein.

What is claimed is:

1. A steering control for a water craft comprising:
- a wedge-shaped base, having mutually inclined upper and lower surfaces, adapted to be attached to the underside of the hull of said craft with its narrower end forwardmost on said hull and with said upper surface adjacent said hull and in water-tight relationship therewith;
- a vane;
- hinge means mounted transverse to said base near the rearwardmost end thereof and attached transversely along the rearwardmost end of said vane thereby permitting said vane to rotate between a fully retracted position adjacent the lower surface of said base and a fully extended position substantially perpendicular to said lower surface;
- a water-tight housing integrally formed on the upper surface of said base and projecting upwardly through the hull of said craft;
- driving means within said housing operatively connected to said vane for rotating said vane between said retracted position and said extended position; and
- control means within the craft for selectively controlling said driving means.

2. A steering device for a water craft comprising:
- a base adapted for attachment to the underside of the hull of said craft;
- a vane, having an upper and a lower surface, rotatably connected at is rearwardmost end to said base near the rearwardmost end thereof for rotation between a retracted position with its upper surface adjacent said base and an extended position substantially perpendicular thereto,
  - the rearwardmost end of said vane being flat and adapted to abut against the underside of said base when the vane is fully extended to prevent the vane from rotating beyond said fully extended position, and
  - said vane having at least one recess in its upper surface, at least one port in its said flat rearwardmost end, and a rearwardly extending passage communicating between said recess and said port;
- drive means operatively connected to said vane and adapted to rotate the vane between said retracted position and said fully extended position; and
- control means operatively connected to said drive means for selectively controlling said drive means.

3. In a steering device for water craft as described in claim **2**, a recess in the underside of said base adapted to receive said vane when it is in its fully retracted position.

4. In a steering device for water craft as described in claim **2** the provision of downwardly rounded corners on the forwardmost end of said vane.

5. In a steering device for water craft as described in claim **2** an upstanding rib having an upwardly exposed cutting edge mounted longitudinally on the upper surface of said vane, and a groove in the underside of said base adapted to receive said rib when said vane is in its fully retracted position.

6. A steering device for water craft as described in claim **2**, having:
- a recess in the underside of said base adapted to receive said vane when it is in its fully retracted position;
- downwardly rounded corners provided on the forwardmost end of said vane; and
- an upstanding rib having an upwardly exposed cutting edge mounted longitudinally on the upper surface of said vane, and a groove in the underside of said base adapted to receive said rib when said vane is in its fully retracted position.

7. A steering device for a water craft comprising:
a base adapted for attachment to the underside of the hull of said craft;
a vane, having an upper and a lower surface, rotatably connected at its rearwardmost end to said base near the rearwardmost end thereof for rotation between a retracted position with its upper surface adjacent said base and an extended position substantially perpendicular thereto;
the rearwardmost end of said vane being adapted to abut against the underside of said base when the vane is fully extended to prevent the vane from rotating beyond said fully extended position;
drive means operatively connected to said vane and adapted to rotate the vane between said retracted position and said fully extended position; and
control means operatively connected to said drive means for selectively controlling said drive means.

8. A steering device for a water craft comprising:
a base adapted for attachment to the underside of the hull of said craft;
a vane, having an upper and a lower surface, rotatably connected at its rearwardmost end to said base near the rearwardmost end thereof for rotation between a retracted position with its upper surface adjacent said base and an extended position substantially perpendicular thereto;
said vane having at least one recess on its upper surface, at least one port in its rearwardmost end, and a passage communicating between said recess and said port;

drive means operatively connected to said vane and adapted to rotate the vane between said retracted position and said fully extended position; and
control means operatively connected to said drive means for selectively controlling said drive means.

9. In a steering device for water craft having a base adapted for attachment to the underside of the hull of said craft and a vane, having an upper and a lower surface, rotatably connected at its rearwardmost end to said base near the rearwardmost end thereof for rotation between a retracted position with its upper surface adjacent said base and an extended position substantially perpendicular thereto, the improvement comprising:
a recess in the upper surface of said vane;
a port in the rearwardmost end of said vane; and
a rearwardly extending passage communicating between said recess and said port.

10. The improved rotatable vane described in claim 9, having its rearwardmost end adapted to abut against the underside of said base when the vane is fully extended to prevent the vane from rotating beyond said fully extended position.

References Cited by the Examiner

UNITED STATES PATENTS

1,256,786	2/1913	Gatchell	114—145
1,442,522	1/1923	Naehenius	114—145
2,402,379	1/1946	De Ganahl	114—145

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