May 12, 1964 J. C. EGGER 3,132,477

STEERING AND WATER PROPULSION SYSTEM FOR WATERCRAFT

Filed July 7, 1961 3 Sheets-Sheet 1

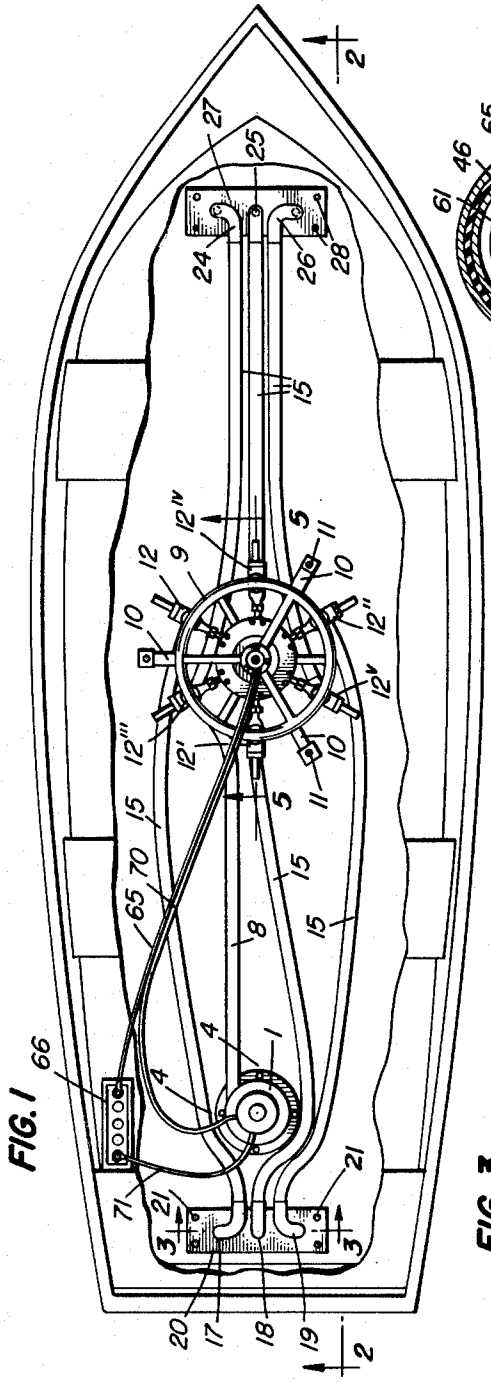


FIG. 1

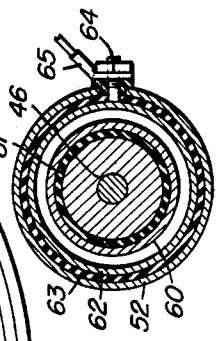


FIG. 13

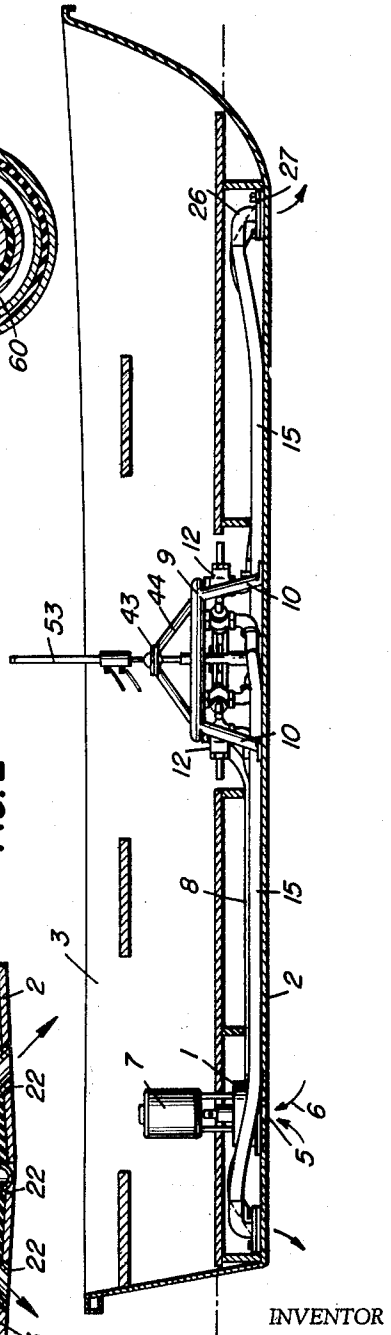


FIG. 2

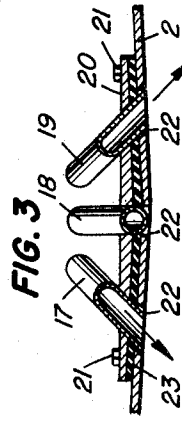


FIG. 3

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STEERING AND WATER PROPULSION SYSTEM FOR WATERCRAFT

Filed July 7, 1961 3 Sheets-Sheet 2

FIG. 4

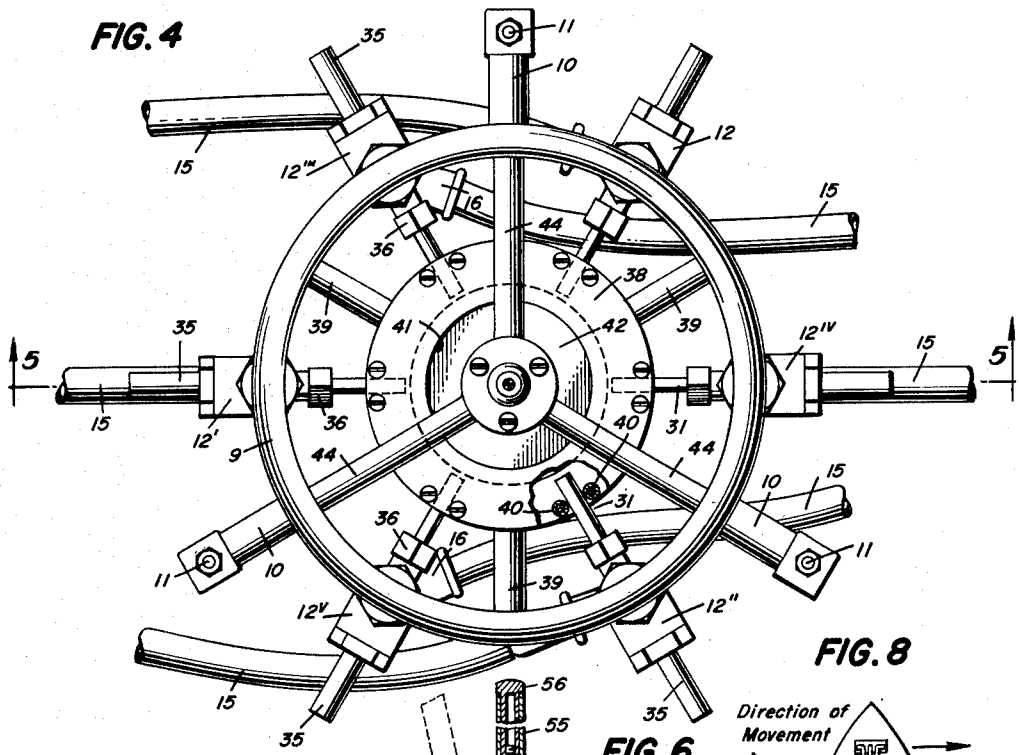


FIG. 8

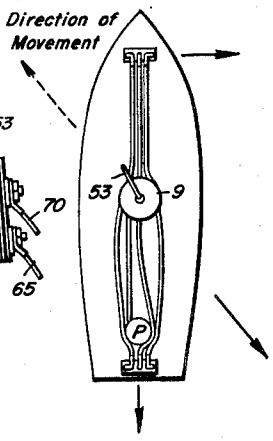


FIG. 6

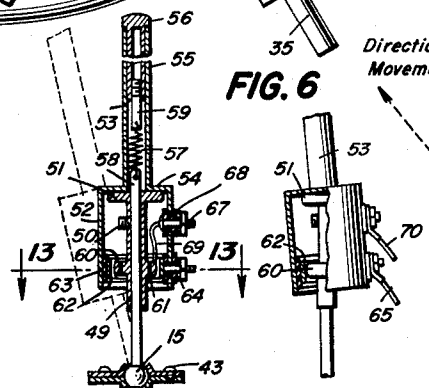


FIG. 7

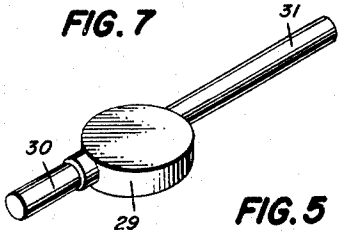
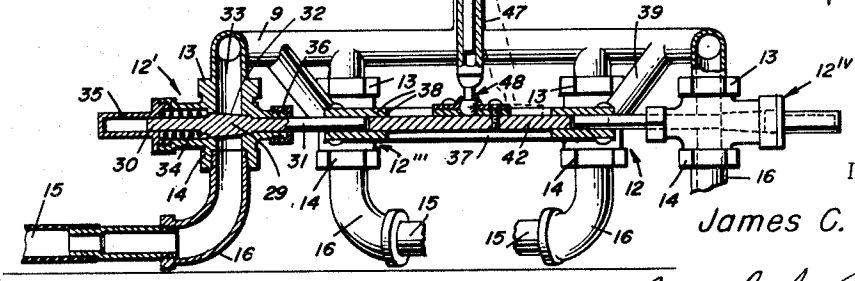


FIG. 5



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STEERING AND WATER PROPULSION SYSTEM FOR WATERCRAFT

Filed July 7, 1961 3 Sheets-Sheet 3

FIG. 9

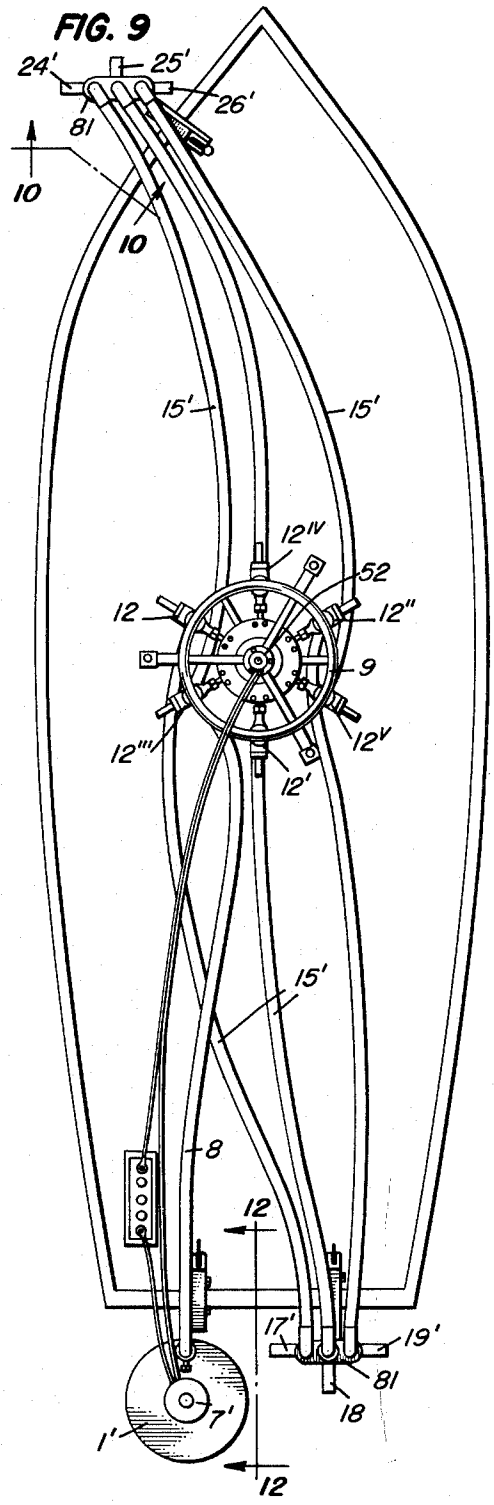


FIG. 10

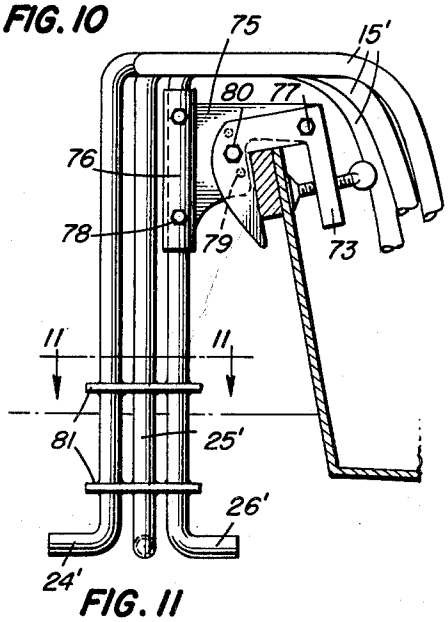


FIG. 11

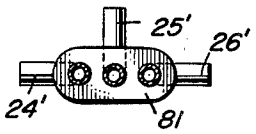
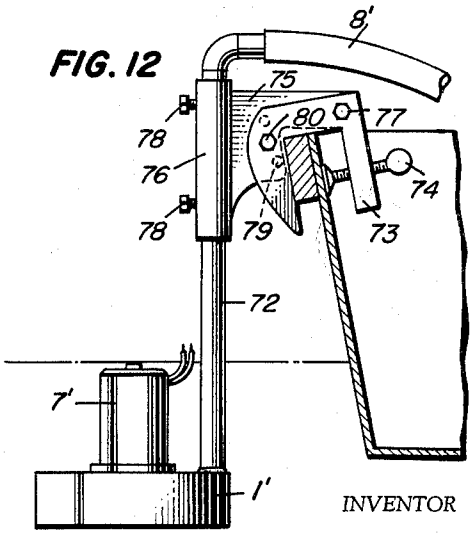


FIG. 12



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3,132,477

STEERING AND WATER PROPULSION SYSTEM FOR WATERCRAFT

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Filed July 7, 1961, Ser. No. 122,445
11 Claims. (Cl. 60—35.54)

My invention relates broadly to steering and propulsion systems for watercraft, and more particularly to a steering and propulsion system for small boats, such as fishing boats, wherein the direction of the boat is selectively controlled by the discharge of water under pressure from selected water discharge outlets located at selected points beneath the boat hull.

The water propulsion and steering system of this invention provides positive control of a watercraft by one person and is particularly adaptable for use on small fishing boats where speed is not an important consideration. The system of the invention is not designed to provide propelling speeds of great velocity to a watercraft, but is rather designed to produce reactionary propelling forces which impart relatively low propelling velocities to the watercraft while providing the craft with positive reactionary direction control.

An electrically-driven water pump supplies water under pressure to a manifold around which are located a series of gate valves which connect the manifold output to individual water jet outlets located around the bottom of the boat in selected positions and oriented to release jets of water in various directions. A cam actuator connected to a steering rod opens the appropriate gate valve, or combination of gate valves, when the steering rod is pushed in the direction in which it is desired to have the boat propelled. By thus selectively opening the desired valve or combination of valves, the boat can be propelled forwardly, rearwardly, sideways, or in any desired direction, without actually turning the boat around, if it is so desired. The jets of water released by the opening of the selected gate valves react with the more static body of water in which the watercraft is disposed and thus impart a reactionary propulsion force to the craft in a direction opposite to the resultant force of the opened valve or combination of valves. In the standard Vector diagram this direction is called the equilibrant.

The steering rod or valve release toggle rod contains an electric switch which closes the electrical circuit to the pump when the steering rod is pushed off of its center position. Thus, when the steering rod is pushed in any desired direction, the pump circuit is closed and the pump operates to supply water to the manifold for release through the selectively opened gate valves. With this arrangement of steering rod a person fishing in a boat alone can have both of his hands free and control the propulsion and steering of the boat by the action of his knees against the steering rod. The pump motor automatically shuts off as soon as the rod is released so that the fisherman can have complete control of the boat by merely pushing the steering rod with his knees.

The main object of the present invention is to provide a construction of water propulsion and steering system for small boats and the like, which can be easily manipulated by a single person and which can be controlled and operated while leaving both hands free for fishing operations.

Another object of the invention is to provide a construction of water jet propulsion and steering system for small watercraft and the like which can be completed and accurately controlled and operated by a selectively positionable steering rod.

Another object of the invention is to provide a construction of water propulsion and steering system for small boats and the like which will enable the boat to be

propelled forwardly, rearwardly, sideways, or in any desired direction.

A further object of the invention is to provide a construction of the water propulsion and steering system for watercraft which is simple in construction and economical to manufacture and install on small boats.

Still a further object of the invention is to provide a construction of water propulsion and steering system for small boats which is portable and which can be easily mounted on and removed from a boat without disfiguration or modification of the boat structure.

Other and further objects of my invention reside in the construction of the steering stick control mechanism as set forth more fully in the specification hereinafter following, in which:

FIG. 1 is a top plan view partly broken away, showing the water propulsion and steering system of the invention installed on a small watercraft;

FIG. 2 is a longitudinal sectional view taken substantially along line 2—2 of FIG. 1, and particularly showing the manner in which the members of the propulsion system are mounted along the bottom of the boat hull;

FIG. 3 is a cross-sectional view through the rear water jet outlet nozzles taken substantially along line 3—3 of FIG. 1;

FIG. 4 is an enlarged top plan view of the water supply manifold and steering mechanism, the view being partly broken away to show the position of a valve stem with respect to the steering rod control cam;

FIG. 5 is a cross-sectional view taken substantially along line 5—5 of FIG. 4, and particularly showing the construction of the steering rod electrical switch, the view showing, in phantom, the manner in which a gate valve is opened by the steering mechanism;

FIG. 6 is a fragmentary sectional view showing the steering rod of FIG. 5 in a position to close the electrical circuit to the pump motor;

FIG. 7 is a perspective view of a valve plate from one of the gate valves;

FIG. 8 is a schematic view diagrammatically indicating the manner in which a boat can be propelled in any desired direction;

FIG. 9 is a top plan view showing the portable water propulsion and steering system of the invention mounted on a small boat;

FIG. 10 is a side elevational view, partly in section, taken substantially along line 10—10 of FIG. 9;

FIG. 11 is a cross-sectional view taken substantially along line 11—11 of FIG. 10;

FIG. 12 is a side elevational view partly in cross-section showing the portable water pump attached to the stern of the boat and taken substantially along line 12—12 of FIG. 9, and

FIG. 13 is a cross-sectional view taken substantially along line 13—13 of FIG. 5, and particularly showing the positioning of the steering rod assembly electrical contact rings.

Throughout the several views similar reference characters refer to similar members of the system of the invention. The stationary system wherein the watercraft is modified to receive a permanent installation of the water propulsion and steering system of the invention is shown in FIGS. 1–3, whereas, the manner in which the portable system of the invention is applied to a boat is shown in FIGS. 9–12.

Referring first to the system of the invention which is permanently installed in a watercraft as shown in FIGS. 1–3, reference character 1 indicates a centrifugal water pump secured to the bottom 2 of the boat 3 by suitable means, such as screws 4, an access hole being provided through the bottom of the boat beneath the pump, as indicated at 5, so that water may be drawn up into the pump,

as indicated at 6. The centrifugal pump 1 is driven by electrical motor 7 to supply water under pressure by means of conduit 8 to the circular water supply manifold 9. The water supply manifold 9 is mounted to the bottom of the boat by means of the support members 10, secured to the boat by screws 11, or other suitable means.

Gate valves 12, 12', 12'', 12''', 12^{iv} and 12^{v}, each having a supply end 13, and a discharge end 14, are evenly distributed around water supply manifold 9 and have their supply ends 13 connected to the water supply manifold so that water may be communicated from the manifold to the gate valves. For purposes of illustrations, I have shown six gate valves connected to the water supply manifold 9 as particularly shown in FIGS. 4 and 5, since I have found six valves sufficient to completely and efficiently control the manipulation and steering of a small boat. It is to be understood however, that any number of valves can be used if it is found that a particular type of watercraft requires more than six water jet outlets to efficiently control the steering and propulsion of the craft.

The outlet ends 14 of the gate valves 12–12^{v} have flexible water-conducting hoses 15 connected thereto, through right angled hose-coupling members 16. Each of these flexible hoses 15 is connected to an individual water jet outlet nozzle or port secured to the bottom of the boat and opening beneath the boat at selected locations; the water outlets each being permanently oriented to direct a jet of water in a selected direction to provide steering control for the watercraft. It will be noted from FIG. 1, that three water jet outlet tubes or nozzles 17, 18 and 19 are securely connected to the mounting plate 20 and connected to the bottom of the boat 2 in the stern position by means of screws 21 or other suitable mounting means. The water tube outlets 17, 18 and 19 extend beneath the mounting plate 20 and through access holes 22 provided in the bottom of the boat so that they may selectively release reactionary jets of water into the more static body of water in which the boat is disposed. A gasket member, shown at 23, provides a watertight seal between the bottom of the boat and the water nozzle mounting plate 20 to maintain the craft in watertight condition. Nozzle 17 is oriented as shown in FIG. 3 to release a jet of water to the portside of the boat to produce a stern reactionary force to starboard, while nozzle 19 is oriented to release a jet of water to the starboard side of the boat to produce a reactionary movement to the stern of the boat to port, and nozzle 18 is oriened to direct a reactionary jet of water directly to the stern of the boat to produce a forwardly directed reactionary movement to the boat.

Similarly, three water jet outlet tubes or nozzles 24, 25 and 26 are mounted in the bow of the boat as shown in FIG. 1. The nozzles are securely connected to a mounting plate 27 similar to the stern mounting plate 20, and the same is secured to the bottom of the boat in similar manner by means of screws 28, or other suitable mounting means. In similar fashion to the stern water jet outlet ports 17, 18 and 19, the corresponding bow outlet ports 24, 25 and 26 extend through access holes in the bottom of the boat, and outlet nozzle 24 is oriented so that it may release a jet of water to the port side of the boat to produce a bow reactionary force to the starboard while outlet nozzle 26 is oriented so that it may release a jet of water to the starboard side of the boat to produce a reactionary movement of the bow to port, and outlet nozzle 25 is oriented to direct a jet of water directly toward the bow of the boat to produce a sternwardly directed reactionary movement to the boat.

The outlet ends 14 of the gate valves 12, 12', 12'', 12''', 12^{iv} and 12^{v} are respectively connected to water jet outlet nozzles or ports 17, 18, 19, 24, 25 and 26 through the flexible water-conveying hoses 15, such that upon the selective opening of any gate valve, or pair of gate valves, a jet of water will be released from the corresponding water jet outlet port, or ports, to impart the desired directional reactionary movement to the watercraft.

As shown more particularly in FIGS. 5 and 7, the gate valves 12–12^{v} are each provided with a slidably tapered valve plate 29, having valve plate guide rods 30 and 31 integrally connected therewith, the valve plates 29 being selectively slidable in a correspondingly tapered slot indicated generally at 32 disposed substantially at right angles to the axis of the gate valve water flow channel 33. The cooperation between the tapered valve plates 29 and the correspondingly tapered valve slots 32 provide positive water cut-off, at all times, when the valves are in the closed position and maintain the slidable valve plates in alignment at all times. The valve plates 29 are normally biased to the closed position to block off flow of water through the valves by means of springs 34 disposed about valve plate guide rods 30 and abutting with the removable threaded valve rod guide members 35. The valve rod guide members 35 are threaded into the main gate valve bodies so that they may be easily removed to give access to the interior of the gate valves for maintenance purposes and to enable the valve plates 29 to be easily removed when necessary.

The valve guide rods 31 extending from the opposite sides of the valve plates 29 from the guide rods 30 extend through the water seal members, indicated at 36, and slidably extend intermediate the spaced guide plates 37 and 38 centrally located beneath manifold 9 and rigidly supported by means of supports 39 connected to water supply manifold 9. Guide plate 37 is rigidly connected to the manifold 9 through supports 39 and then guide plate 38 is spaced from guide plate 37 by means of screws and spacer members indicated at 40, in FIG. 4, disposed on opposite sides of each of the valve guide rods 31 so that they may also serve as guide members for these rods. Guide plate 38 is provided with an opening indicated at 41 and a circular valve opening cam or disc 42 having a diameter greater than guide plate opening 41 and slightly smaller than the diameter of the circle formed by the ends of the valve guide rods 31 of gate valves 12–12^{v}, as shown in FIGS. 4 and 5, is slidably disposed intermediate the guide plates 37 and 38.

A socket mounting assembly 43 for a ball pivot connector 45 is rigidly supported above and centrally of water supply manifold 9 by means of support members 44 rigidly connected to the manifold 9. The ball connector 45 is rigidly carried by a rod member 46 the lowermost end of which is movably supported in the cylindrical cup support member 47, which in turn is connected to the cam 42 through a ball and socket joint 48. The rod member 46 forms the bottom portion of the steering rod or valve release toggle rod assembly shown more particularly in FIGS. 5 and 6.

A sleeve member 49 engages the upper portion of rod 46 and is secured thereto by means of an Allen screw 50 or other suitable securing means. A circular collar 51 is integrally carried by the uppermost portion of sleeve member 49 to serve as a spacer means between the sleeve member 49 and the inverted cup portion 52, of the steering rod 53, which encases the sleeve member 49. The end wall 54 of the inverted cup portion 52 is normally disposed in abutting relation with the circular collar 51, as shown more particularly in FIG. 5. A portion of the upper end of rod member 46 extends above the circular collar 51 and into the hollow bore of the steering rod 53. A tubular member 55, carrying a terminating head 56 and having a bore threaded at its lower end, is snugly fitted into the upper end of steering rod 53. A lug member 59 is threaded into the bore of tube member 55 as shown, and a spring member 57 is connected between the lug 59 and the upper portion of rod 46 as indicated at 58 to thus provide a movable coupling between the steering rod with

its associated inverted cup member and the rod member 46 with its circular collar 51.

An electrical contact ring 60 is carried about the perimeter of sleeve member 49, the contact ring being insulated from the sleeve member by means of the insulation ring 61. The inverted cup portion 52 of the steering rod 53 carries a cooperating electrical contact ring 62 on the interior bore thereof in the same horizontal plane as the contact ring 60. The steering rod contact ring 62 is spaced away from and normally out of contact with contact ring 60, as shown in FIG. 5, and is insulated from the inverted cup portion 52 by means of insulation ring 63. A lug member 64, connected with steering rod contact ring 62, extends through and is insulated from the inverted cup portion and an electrical wire 65 in electrical connection with the lug member extends into electrical connection with one terminal of the battery 66, as shown in FIG. 1.

An electrical connector lug 67 is disposed through the wall of the inverted cup portion 52, at a position above steering rod contact ring 62, and is insulated therefrom by means of an insulation grommet 68. A flexible insulated wire 69 extends in electrical connection interiorly of the inverted cup portion between the lug 67 and the contact ring 60. An electrical conductor 70 extends from the lug member 67 to one terminal of the pump motor 7 to complete the circuit from the steering rod contact ring 60 to the pump motor. The other terminal of the pump motor is connected to the remaining terminal of battery 66 through wire 71, to thus complete the electrical circuit of the selective water jet steering system. Thus the open circuit between the steering rod contact ring 62 and the cooperating contact ring 60 acts as a switch to close the electrical circuit to the pump motor.

To operate the water jet steering system, the steering rod 53 is pushed toward the direction in which it is desired to have the boat propelled, as indicated in FIG. 8. Since the steering rod assembly 53 is resiliently coupled to the rod member 46 by means of spring 57, when the steering rod is pushed in a desired direction the inverted cup portion 52 rocks upon the circular collar 51 so that steering rod contact ring 62 moves into electrical connection with the cooperating contact ring 60 to complete the electrical circuit to the pump motor, thus putting the pump in its operational state, supplying water under pressure to water supply manifold 9. As the steering rod 53 is displaced further in the direction in which it is desired to have the boat propelled, rod member 46 is pivoted about its ball and socket joint 45, 43 and the valve opening cam 42, at the lower extremity of the rod, is moved into contact with the end of the valve guide rod or pair of valve guide rods 31 which are positioned in its path of movement. As the valve opening cam 42 is displaced further from its center position, the rod 46 adjusts itself axially within the cylindrical cup coupling 47 and the valve guide rod or rods 31 and the valve plates 29 carried thereby are displaced from their normally closed spring-biased position, as shown in full lines in FIG. 5, to the open position as shown in dotted lines in FIG. 5, as more displacement force is applied by the cam member to the ends of the guide rods. As indicated, the direction of boat propulsion will generally be in the direction that the valve rod is displaced as shown in FIG. 8, and the magnitude of the steering rod displacement will determine the quantity of water flow through the selectively opened ports, since the degree of valve opening is directly proportional to the displacement of the steering rod. Thus the thrust developed, from the selectively opened jets or ports under the boat, is directly proportional to the magnitude of the steering rod displacement. As a valve is selectively opened in this manner the water under pressure in manifold 9 is communicated to the outlet nozzle or port connected with the particular valve to thereby produce a reactionary force to the craft in an opposite direction from the direction in which the water jet is released.

Since it is merely necessary to displace the steering rod in the direction it is desired to propel the craft, the craft can be easily propelled by the knees of the fisherman, thus leaving both of the fisherman's hands free for fishing operations. When the steering rod is released it is automatically returned to its neutral position by action of the valve biasing springs 34 and the action of the steering rod coupling spring 57 returns the steering rod 53 to axial alignment with rod member 46 to thus open the pump motor circuit to cease propulsion of the boat and operation of the centrifugal water pump.

As shown in FIG. 2, the connecting hoses 15, together with the associated water jet outlet nozzles or ports and the centrifugal pump, can be housed beneath floor boards in the bottom of the boat so that the boatman does not come in contact with these members. In lieu of the construction of the steering rod electrical switch shown in the drawings, the operation of the pump motor could also be controlled by an electrical push button switch located on the top of the steering rod to allow the operator to control pump operation by depressing the switch with his thumb. Of course, with this construction the operator would not have both hands free for fishing operations as provided by the preferred embodiment of the invention. The steering system of this invention can also be adapted to larger craft by merely increasing the size of the water supply manifold, the associated valves, nozzles, and other members. On larger installations it may be desirable to provide small roller wheels rotatively journaled on the ends of the valve rods 31 to provide rolling contact between the valve rods and the cam 42 to produce smoother operation of the enlarged units.

In FIGS. 9–12, a modified form of the invention is shown, disclosing a portable system which can be mounted on any small watercraft without modifying the craft and which can be removed from the watercraft without damaging the same in any way. In this form of the invention the water supply manifold and the steering rod assembly are the same as shown and described in the preferred embodiment of the invention and the operation is the same as previously described. The waterproof pump motor 7' is mounted to the centrifugal pump 1' and the entire assembly is supported under water by a supporting water supply pipe 72. The water pump assembly is secured to the end wall of the boat by means of a C clamp 73 with an adjustable thumb screw 74 for tightly securing the clamp to the boat. A bracket 75 having a hollow sleeve portion 76 integral with one end thereof is pivotally connected at 77 to C clamp member 73. Supporting water supply pipe 72 is fitted within and is axially adjustable within the hollow sleeve portions 76 so that the pump and motor assembly can be mounted exteriorly of the boat and can be submerged beneath the water at a desired depth merely by adjusting pipe 72 within sleeve 76 and securing the same in the desired position by means of set screws 78. Thus the pipe 77 serves as the support for maintaining the pump and motor beneath the surface of the water and also serves as the main water supply pipe for supplying water under pressure from the pump 1' to the manifold 9 by means of flexible water conduit 8'.

The C clamp device also allows for adjustment in the vertical plane so that the pump can be maintained in a horizontal plane beneath the water. A series of adjustment holes 79 are provided in the pivoted bracket 75 in a position so that they are selectively registerable with an aperture in the C clamp 73. A pin 80 is passed in the holes in the C clamp and through one of the several adjustment holes in the pivoted bracket to rigidly connect the bracket 75 to the C clamp 73 in a position such that the member supported by the sleeve portion 73 is maintained in vertical alignment. With such a construc-

tion the components of the system can be adapted to boats whose sides and endboards are disposed at varying angles. In lieu of the water jet nozzles described in the preferred embodiment of the invention an arrangement of three water jet pipes is clamped to the back of the boat as shown at 17', 18' and 19', and to the gunwale of the front of the boat as shown at 24', 25' and 26'. The water jet pipes are of a length so that they extend from above the gunwale of the boat to beneath the bottom of the boat as shown in FIG. 10, each pipe having substantially a right angle bend at its lower extremity and the group of three pipes having their end discharge portions positioned to expel water in directions similar to those described in the preferred embodiment of the invention, that is, two of the pipes disposed to expel water to opposite sides of the craft and the remaining pipe disposed to expel a jet of water either to the front or to the rear of the craft. The three pipes are securely connected into their particular arrangement by means of brackets 81 which are secured thereto by welding or other suitable fastening means to maintain the group of pipes integral with each other.

The front water jet expelling pipes 24'–26' are secured to the gunwale of the boat adjacent the bow by means of a C clamp 73 and adjustable bracket 75 as described in connection with the pump supporting means. As with the pump support pipe, the water jet pipes can be adjusted in the vertical plane by means of the pivoted bracket adjustment holes 79 and the C clamp pin 80. Thus the water jet pipes can be vertically positioned so that they can properly expel their jets of reactionary water, independent of the slope of the gunwale of the boat to which they are connected. This pin adjustment thus enables the jet pipes to be swung a few degrees toward or away from the boat to compensate for the slope of the gunwale or back of the boat.

The arrangement of jet pipes is provided with a certain amount of free movement up and down in the horizontal plane to allow the expelling ends of the pipes to be positioned beneath the bottom of the boat. With regard to the front water jet pipes 24', 25' and 26', the pipe nearest the boat 26' is adjustable axially, slidable within the clamp sleeve portion 76 and can be secured at any desired height by means of the set screws 78 which secure the arrangement of jet pipes to the clamp member.

The center pipe of the rear jet pipe assembly 17', 18' and 19' is slidably engaged by the sleeve portion 76 of a similar adjustable C clamp bracket connected to the back wall of the boat. In similar fashion the jet pipe is axially adjustable within the sleeve portion and is secured at the desired level by means of set screws or other suitable fastening means. Similar to the front group of water jet pipes, this rear group of water jet pipes is also adjustable in the vertical plane by means of the pivoted bracket adjustment holes 79 and the C clamp pin 80. As in the preferred form of the invention, the water jet outlet pipes 17', 18' and 19', 24' 25' and 26', are respectively connected to the selectively operable gate valves 12–12v by means of flexible water-conveying conduits 15'. These conduits run along the bottom of the boat and over the sides to make connection with the tops of the water jet pipes as shown. It can easily be seen that when the system is removed from the boat so as to convert the boat back to a conventional watercraft, the boat has not been mutilated in any manner whatsoever. The electrical circuit and the operation of the portable system is identical with the preferred embodiment of the invention.

While I have described my invention in certain of its preferred embodiments, I realize that modifications may be made, and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is as follows:

1. Apparatus for steering and propelling a watercraft by means of selectively releasable jets of water under pressure comprising, a water supply pump, an annular manifold connected to receive water under pressure from said pump, a multiplicity of selectively operable valves connected to and disposed about said manifold, a valve operating member extending from each of said valves, a multiplicity of water outlet ports positioned for expelling jets of water in different directions, water-conveying conduits connecting said multiplicity of water outlet ports to said manifold via said multiplicity of selectively operable valves, a movable steering rod, a cam member connected to said steering rod, said cam member being positioned adjacent the valve operating members and being selectively movable by said steering rod to open one or more of said selectively operable valves through the valve operating members for expelling jets of water from the manifold through selected outlet ports for propelling a watercraft substantially in the direction said steering rod is moved.

2. Water jet propulsion and steering apparatus for watercraft comprising, water outlet means for expelling jets of water in different directions, valve means connected to supply water under pressure to said outlet means, a movable upstanding rod, a cam member pivotally connected to said rod and operatively connected to selectively open said valve means, a water manifold disposed in surrounding relation to said upstanding rod and adapted for connection to a water pump to constantly receive water under pressure throughout its length, said valve means connected to receive water from said water manifold whereby displacement of said cam member by movement of said rod from the upstanding position selectively opens one or more of said valve means for expelling jets of water from said water outlet means for propelling a watercraft substantially in the direction said rod is moved.

3. Water jet propulsion and steering apparatus as set forth in claim 2 in which said upstanding rod is universally connected to said surrounding water manifold and is disposed in spaced relation therewith.

4. Water jet propulsion and steering apparatus as set forth in claim 2 in which said water manifold is annular in form, and said annular water manifold and said upstanding rod being connected in concentric relation.

5. Apparatus for steering and propelling a watercraft as set forth in claim 1 including an end extension encircling the upper end of said steering rod and pivotally connected thereto, switch means connected between said end extension and said steering rod and electrically connected for selective operation of said water supply pump, and said switch means being operable to operate said pump upon pivotal movement of said end extension relative to said steering rod.

6. Water jet propulsion and steering apparatus for watercraft as set forth in claim 2 in which said cam member is selectively displaceable in the horizontal plane.

7. Water jet propulsion and steering apparatus for watercraft comprising a water supply compartment, means for supplying water under pressure to said compartment connected therewith, water jet outlet means, valve means connected to selectively convey water from said compartment to said water jet outlet means, an upstanding movable steering rod universally mounted intermediate its ends to said water supply compartment, and displaceable disc means connected on one end of said steering rod and operatively associated with said valve means for selective opening of said valve means to propel a watercraft substantially in the direction of movement of said steering rod.

8. Water jet propulsion and steering apparatus for watercraft, as set forth in claim 7 in which said means for supplying water under pressure to said compartment

includes an electrically-operable pump, switch means, said switch means electrically connected with said pump and carried by said upstanding movable steering rod and operable for selectively automatically operating said pump when said steering rod is moved from the upstanding position.

9. Water jet propulsion and steering apparatus for watercraft comprising a water supply compartment, means for supplying water under pressure to said compartment connected therewith, water jet outlet means, valve means connected to selectively convey water from said compartment to said water jet outlet means, displaceable disc means associated with said valve means for selective opening of said valve means, and a displaceable steering rod member connected for displacement of said disc to open the appropriate valve means to propel a watercraft substantially in the direction in which the steering rod is displaced.

10. Water jet propulsion and steering apparatus for watercraft as set forth in claim 9 in which said disc means is positioned centrally of said water supply compartment.

11. Water jet propulsion and steering apparatus for watercraft comprising, annular water supply means, means for supplying water under pressure to said annular

water supply means, water jet outlet means, a plurality of valve means disposed about said annular water supply means and connected to selectively convey water from said annular means to said outlet means, a horizontally slideable disc member operatively connected to said plurality of valve means, and manually operable universally movable means connected to said disc member and connected centrally of said annular supply means for selectively sliding said disc member for selective operation of said plurality of valve means to produce a propulsion force from said water jet outlet means for movement of a watercraft in the direction of movement of said universally movable means.

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