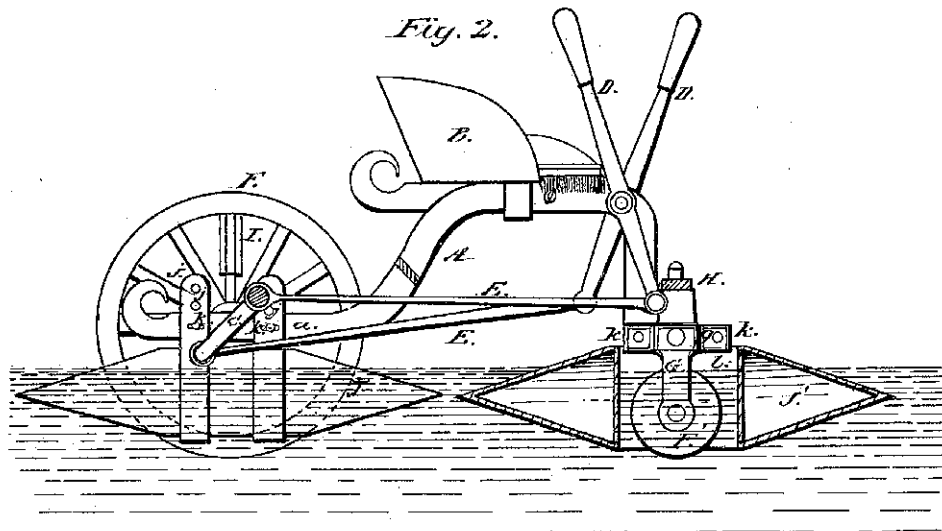
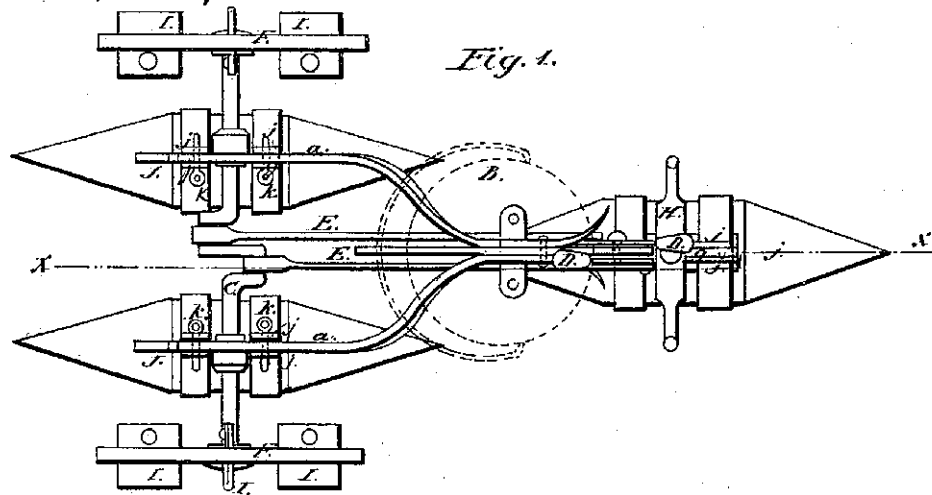




*D. J. Farmer*  
*Land & Water Velocipede.*  
*Nº 92,807. Patented Jul. 20, 1869.*



*Witnesses;*  
*W. B. Deming*  
*John Grinnell*

*Inventor*  
*D. J. Farmer*  
*by Knight, Broag &*  
*Attorneys*

# United States Patent Office.

DAVID J. FARMER, OF WHEELING, WEST VIRGINIA.

Letters Patent No. 92,807, dated July 20, 1869.

## IMPROVEMENT IN LAND AND WATER-VELOCIPED.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, DAVID J. FARMER, of Wheeling, in the county of Ohio, and State of West Virginia, have invented a new and useful Improved Land and Water-Velocipede; and the following is a sufficiently full, clear, and exact description, to enable one skilled in the art to which my invention appertains, to carry it into effect, reference being had to the accompanying drawings, which are made part of this specification.

My invention relates to an improved construction of velocipedes, or the provision therein of certain parts, to adapt them to be readily converted for use either on land or water, said parts being adapted to be removed, or so adjusted as to be out of the way when not required for use.

My improvements consist in a novel construction and arrangement of floats for supporting the vehicle on the water, and in the adaptation of said floats to be adjusted to support the vehicle a greater or less height above the surface of the water as required, and to be removed when not in use; and in the employment, in combination with said arrangement of removable floats, of wheels, adapted to be converted to form draught or paddle-wheels, as required.

In the drawing, a velocipede illustrating my invention is represented as used on the water—

Figure 1 being a plan view, with the seat removed, and its position indicated by dotted lines, and

to receive between them the wings or legs *a a* of the frame *A*, and a cross-bar, *g*, of the swivelled standard *G*, which, being correspondingly perforated, they are fastened to by transverse pins or keys *k*, passing through the perforations in each.

By the duplication of the perforations in the ears or flanges *j j*, as shown at *j*, fig. 2, the floats are adapted to be adjusted so as to vary the height they support the vehicle at, as desired.

Said ears or flanges may be the ends of bands or straps passing around the floats, as shown, or be attached thereto in other suitable manner.

The float *J'* is provided with a recess or cavity, *l*, for the reception of the guiding-wheel *F'*, over which it is applied.

The vehicle provided as above described, placed in the water as represented in fig. 2, is supported by the floats *J J'*. By the blades or wings *I*, the rotation of the driving-wheels *F* is made to propel it; and, by the movement of the treadles *H* and front float, *J'*, it is guided as readily as were it on land, which it is further adapted to run on with these provisions attached, as indicated by the red line in fig. 2.

By removing the floats *J J'*, and folding the blades or wings *I* between the spokes of the wheels, or removing them, the vehicle is adapted, with minimum bulk, for running on land.

I reserve attaching the schedule of claims.

W. ASCOUGH.

Propelling Mechanism for Boats.

No. 166,839.

Patented Aug. 17, 1875.

FIG. 1.

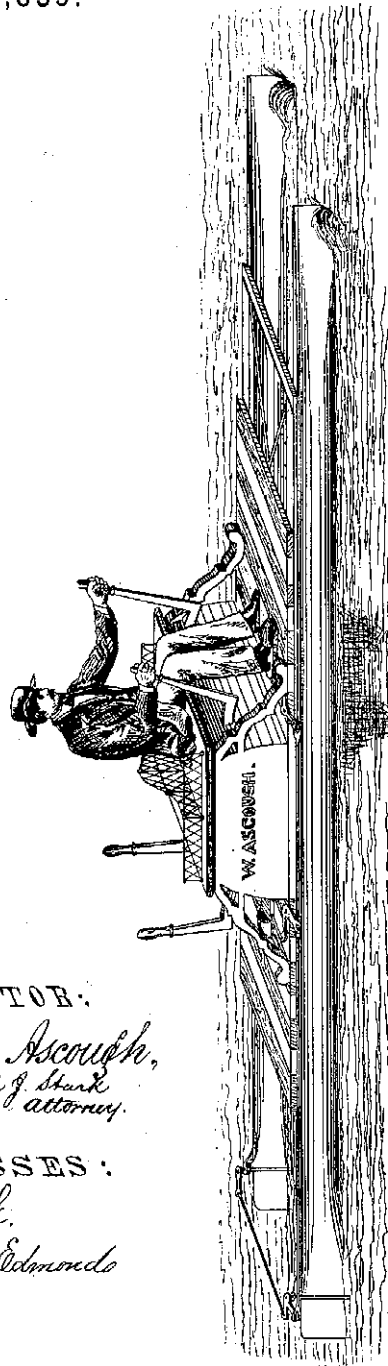
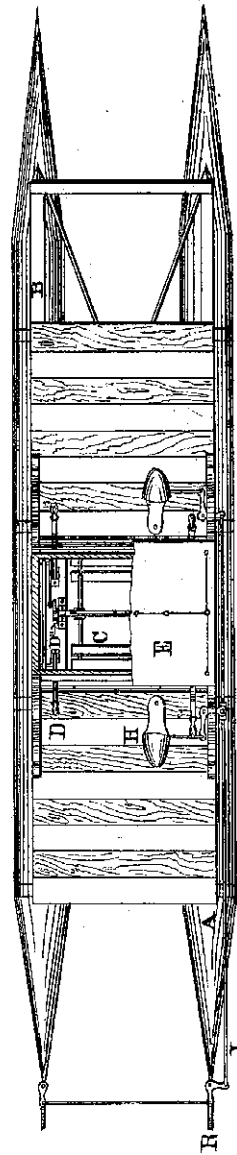


FIG. 2.



INVENTOR:

*William Ascough,*  
*by Michael J. Stark*  
*Attorney.*

WITNESSES:

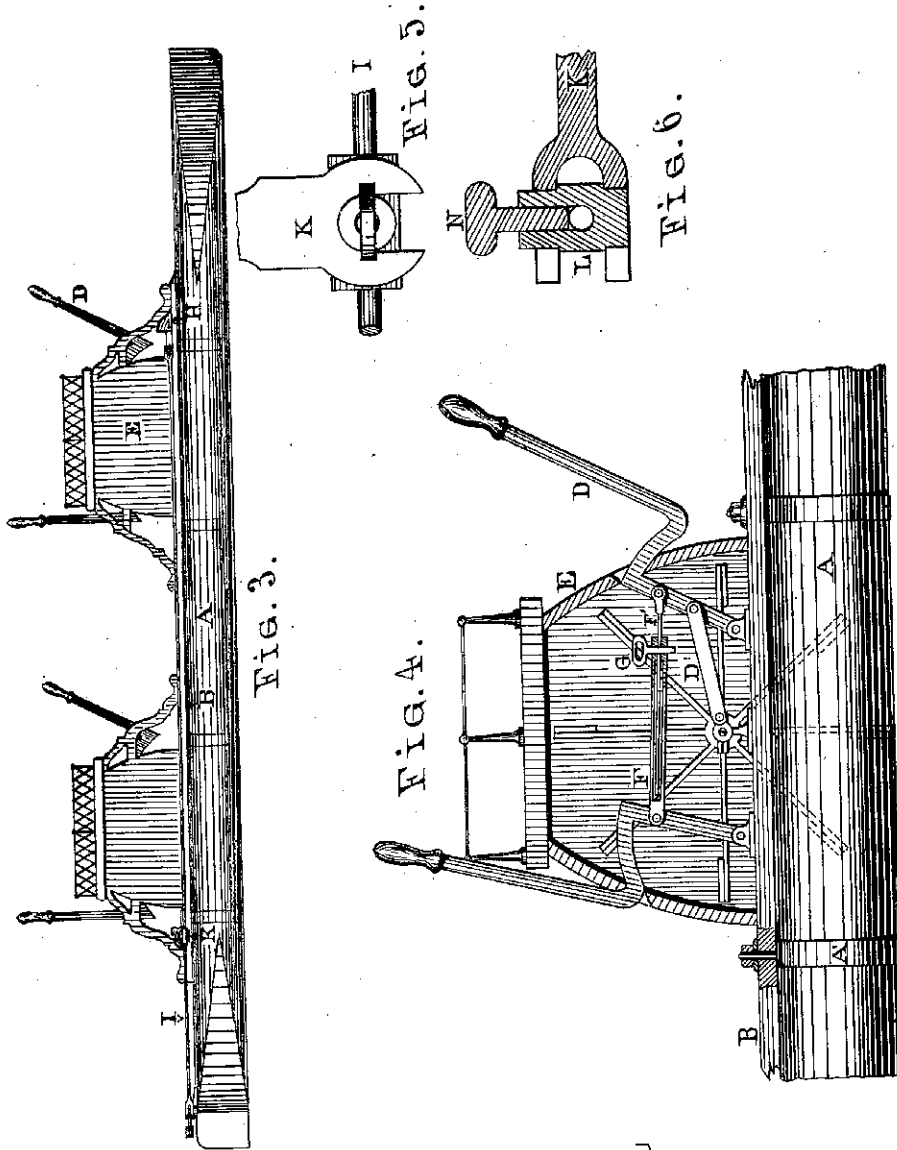
*A. Stark.*  
*John B. Edmonds*



W. ASCOUGH.  
Propelling Mechanism for Boats.

No. 166,839.

Patented Aug. 17, 1875.



WITNESSES:

A Stark  
John B. Edmonds

INVENTOR:

William Ascough,  
by Michael J. Stark  
attorney.

# UNITED STATES PATENT OFFICE.

WILLIAM ASCOUGH, OF BUFFALO, NEW YORK.

## IMPROVEMENT IN PROPELLING MECHANISMS FOR BOATS.

Specification forming part of Letters Patent No. 166,839, dated August 17, 1875; application filed June 14, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM ASCOUGH, of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements on a Floating Velocipede; and I do hereby declare that the following is a full, clear, and exact description of the same, having reference to the accompanying drawings making a part of this specification, and illustrating my invention more fully. In the same—

Figure 1 is a perspective, and Fig. 3 is a longitudinal elevation, of my boat. Fig. 2 is a plan of the same; and Figs. 4, 5, and 6 are detached views of the working parts.

The nature of my present invention will first be described, and then pointed out in the claims.

A in the drawings, in which like letters of reference indicate similar parts wherever they appear, are two pontoons, placed at suitable distance apart. They are either of a cylindrical or parabolic cross-section, have very acute ends, and are divided each into a number of air-tight compartments. I make these pontoons of galvanized or other sheet-iron, about eighteen feet long, and from nine to twelve inches in diameter, (but other suitable dimensions may answer as well,) and place them about eighteen inches apart. Upon these pontoons I build a frame, B, of wood, properly braced, and fasten the same with the bands A', having projecting bolts, as shown in Fig. 4. This frame connects the two pontoons, a floor being laid thereon in a substantial manner, and prevents them from going apart. The boat is propelled by a paddle-wheel, or a number of paddle-wheels, C, placed between the two pontoons A, and operated by the hand-levers D, connecting-rods D', and cranks D'', as clearly illustrated in Fig. 4. E is the paddle-box, serving also as a seat for the person or persons operating the hand-levers D. These levers pass through openings in the paddle-box, which they fit snugly, and are bent in such a manner as to prevent the escape of water through these openings. I place two sets of these hand-levers on every paddle-wheel,

and connect each set with the other by the connecting-rods F, constructed, as shown in Fig. 4, in such a manner that, by withdrawing a key, G, one set of levers will be put intact, so that they will not operate when only one person actuates the other set. This I do to prevent unnecessary friction, and for the better appearance.

In Fig. 3 I have shown a boat having two paddle-wheels and accessories, so that four persons can ride and operate the boat. In this case I make the pontoons proportionately larger, to give it the proper capacity without submerging it too much.

A boat constructed as described is adaptable to many purposes, although that of sport and for recreation may be its principal object, and as it cannot easily sink it will make an excellent pleasure or life boat. Rubber bags inflated, or corks, &c., may be attached to the pontoons to provide for additional safety.

Having thus fully described my invention, in order to enable others skilled in the art to which it pertains to make and use the same, I desire to have secured to me by Letters Patent the following:

1. The pivoted levers D, extending through the front and rear walls of the paddle-box, in combination with the connecting-rods D' and F, cranks D'', and the paddle-wheel C, the whole arranged to operate substantially as described, and for the use and purpose set forth.

2. The combination, with the bent levers D, extending through the front and rear sides of the wheel-box, of the connecting-rods, consisting of the socket F, sliding bar F', and the key G, whereby the levers are connected and disconnected, substantially as described and shown.

In testimony whereof I, the said WILLIAM ASCOUGH, have hereto set my hand and seal this 3d day of June, 1875, in the presence of two subscribing witnesses.

WM. ASCOUGH. [L. S.]

Witnesses:

MICHAEL J. STARK,  
JOHN B. EDMONDS.



H. FOX.

DEVICE FOR PROPELLING BOATS.

No. 176,947.

Patented May 2, 1876.

Fig. 1.

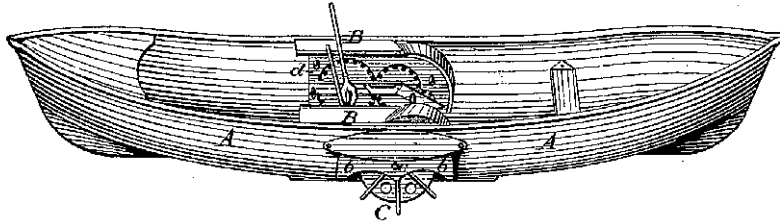


Fig. 2.

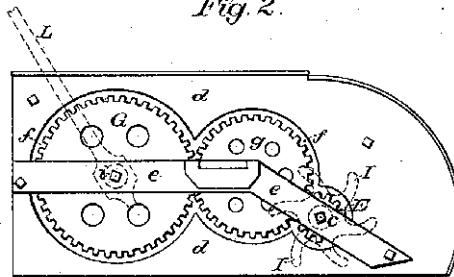
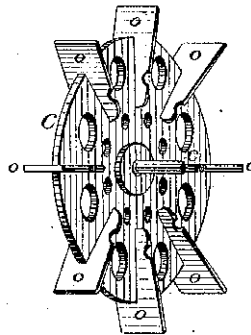


Fig. 3.



Attest:

*C. A. Snow*

Inventor:

*Henry Fox,*  
by *Louis Baggett & Co.,*  
*Att'ys*

# UNITED STATES PATENT OFFICE

HENRY FOX, OF WATERLOO, NEW YORK.

## IMPROVEMENT IN DEVICES FOR PROPELLING BOATS.

Specification forming part of Letters Patent No. **176,947**, dated May 2, 1876; application filed April 7, 1876.

*To all whom it may concern:*

Be it known that I, HENRY FOX, of Waterloo, in the county of Seneca and State of New York, have invented certain new and useful Improvements in Propelling Boats; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a perspective view of a boat having my improved propelling device, Fig. 2 is an enlarged view of the propelling machinery, and Fig. 3 shows one of the paddle-wheels removed.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to propelling devices for boats; and it consists in so constructing the same as to render it specially adapted for hunting and fishing purposes, substantially as hereinafter more fully shown and specified.

In the drawing, A is the body of the boat. This may be constructed of wood, metal, or any other suitable material, and of any suitable shape. It has on the sides two recesses, covered with metallic boxes B B, in which the paddle-wheels C C work.

The axles *c* of the paddle-wheels C have their bearings in the exterior plates *b* and interior plates *d* of the boxes B, as shown in Fig. 1, or in plates *b* and suitable intermediate braces *e*, as in Fig. 2.

Between plates *b* and *d* are covering-plates *f*, and between these and plates *d* is the gearing by which the paddle-wheels are operated. This gearing I will now proceed to describe:

Axle *c* has a pinion, E, engaging with a cog-wheel *g*, the axle of which has its bearings in plates *f* and *d*. Cog-wheel *g* engages with a larger cog-wheel, G, the axle of which, *i*, projects beyond plate *f*, as does axle *c*. Motion may be imparted to the machinery in

any suitable manner, preferably by means of sprocket-wheels I or reciprocating-levers L, the former, adjusted upon axles *c*, being the most advantageous when but low speed is to be attained, and the latter, when adjusted upon axles *i*, being preferable when great speed is desirable. The sprocket-wheels I and levers L being removable, their position may, of course, be reversed, at the option of the occupants of the boat.

It will, from the foregoing description, be observed that the paddle-wheels C, instead of, as is usually the case, working in boxes extending from the sides of the boat, are incased by boxes formed by recesses in the sides. This is partly in order to diminish the bulk of the boat, partly in order to facilitate its propulsion, (by decreasing its resistance to the water,) and partly to enable it to be propelled without disturbing the water, a feature of great importance on shooting expeditions. In order to increase the effectiveness of this latter feature the feathers *o* of the paddles are placed slightly obliquely, so as to throw the water under the boat rather than to the sides.

From the foregoing description the operation and advantages of my device will be readily understood. When operated by levers L, adjusted upon axles *i*, great speed may be attained partly on account of the great power which may be thus exerted, and partly on account of the shape of the boat, which offers no obstructions to its progress in the water.

When, as is frequently the case on shooting and fishing expeditions, it is desirable to propel the boat while lying down, so as to avoid being seen, it may be easily done by means of the sprocket-wheels I.

The boat may be readily steered or turned, and being very easily propelled, (especially by levers L when adjusted upon axles *i*), it is also well adapted for pleasure excursions, where comfort is an object, without regard to speed.

From the simplicity of the gearing the machinery is naturally strong and compact, and

water cannot enter the boat through the bearings provided for the axles of the gearing, it being excluded by the plate *f*.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

The combination of paddle-wheels C, having axles *c*, pinion E, cog-wheels *g* G, and plates *d* *f*, substantially as and for the purpose herein shown and specified.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in presence of two witnesses.

HENRY FOX.

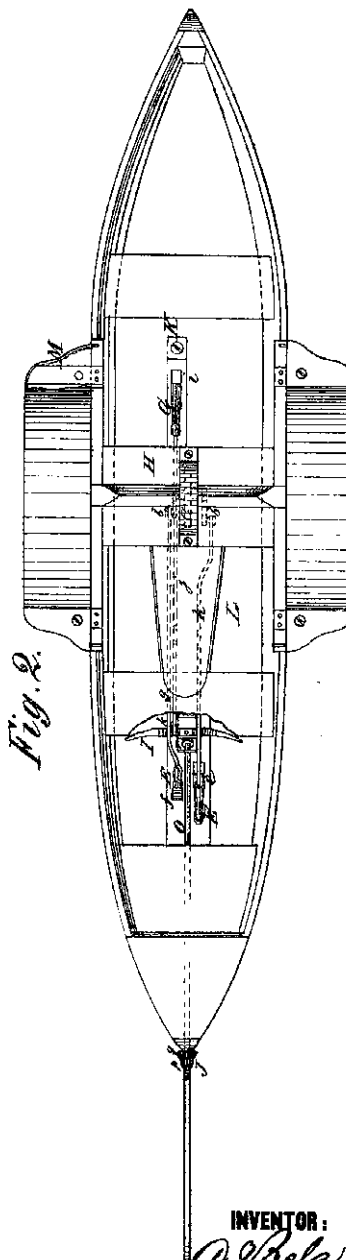
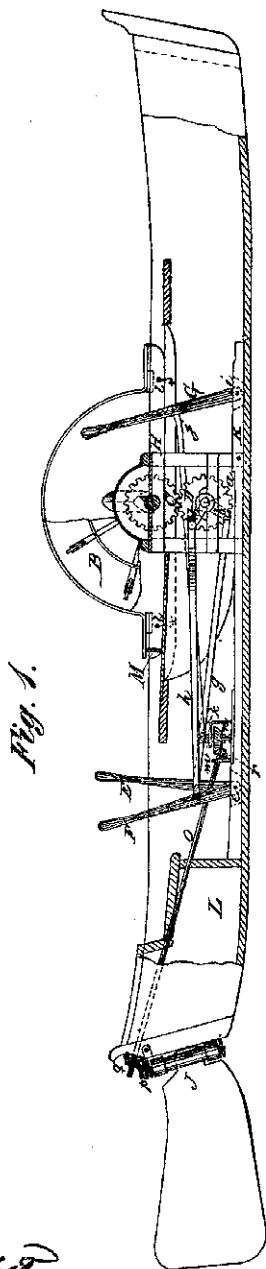
Witnesses:

WM. BAGGER,  
LOUIS BAGGER.

A. BELZ.  
PROPELLING BOATS.

No. 185,662.

Patented Dec. 26, 1876.



WITNESSES:  
*H. Rydquist.*  
*John Goethals.*

INVENTOR:  
*A. Belz.*  
BY *Munn & Co.*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE

ALBERT BELZ, OF APPLETON, WISCONSIN.

## IMPROVEMENT IN PROPELLING BOATS.

Specification forming part of Letters Patent No. 185,662, dated December 26, 1876; application filed June 6, 1876.

*To all whom it may concern:*

Be it known that I, ALBERT BELZ, of Appleton, in the county of Outagamie and State of Wisconsin, have invented a new and Improved Boat-Propeller, of which the following is a specification:

Figure 1 is an elevation in section. Fig. 2 is a plan.

Similar letters of reference indicate corresponding parts.

The invention will first be described in connection with the drawing, and then pointed out in claims.

In the drawing, A is the paddle-wheel shaft, provided with ordinary paddle-wheels B. C is a spur-wheel, which is keyed to the shaft A, and takes its power from a similar wheel, D, which is fixed upon the shaft a. The cranks b b' are placed on opposite ends of the shaft a, and are arranged at right angles to each other. E F are levers, which have their fulcrum at e f, and communicate motion to the cranks b b' through the connecting-rods g h. G is a lever, having a fulcrum at i, and transmitting its motion through the connecting-rod j to the rod g, these rods being pivoted together at k. The spur-wheel D, the paddle-wheel B, and accompanying devices are supported upon a frame, H, which is not permanently attached to the boat L, being retained in position by the hooks l l.

To remove the entire propelling apparatus from the boat, it is only necessary to loosen

the hooks l l and withdraw the pins at e and i, when it may be readily lifted out.

M is a guard, consisting of an iron rod, which is hooked onto the frame H at each end, and extends across the outside of the wheel-house. The levers E, F, and G have a common bed-piece, K, which is also mortised to receive the tenons of the detachable frame H. The steering apparatus consists of a T-lever, I, placed upon a short vertical shaft, m, in the bottom of the boat, near the stern. The motion of the lever I is communicated to the rudder-post J through the inclined shaft o and bevel-wheels n, p, q, and r.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the detachable frame H, carrying the wheels B, and boat L, as shown and described.
2. The combination of the lever I, shaft o, rudder-post J, and wheels m n p q, as shown and described.
3. The combination of the bed-piece K, levers E F G, and frame H, substantially as specified.
4. The combination of the guard M and detachable frame H, substantially as shown and described.

ALBERT BELZ.

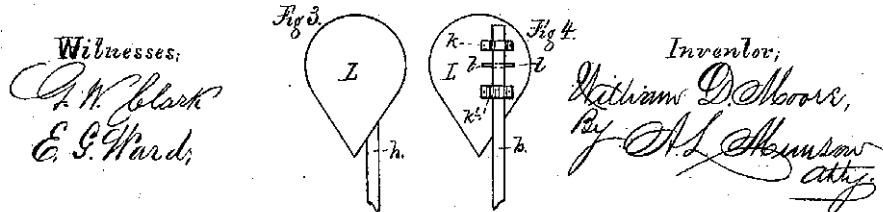
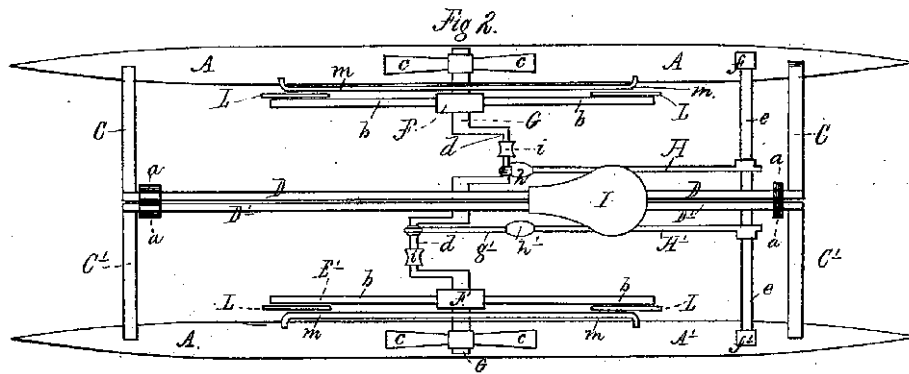
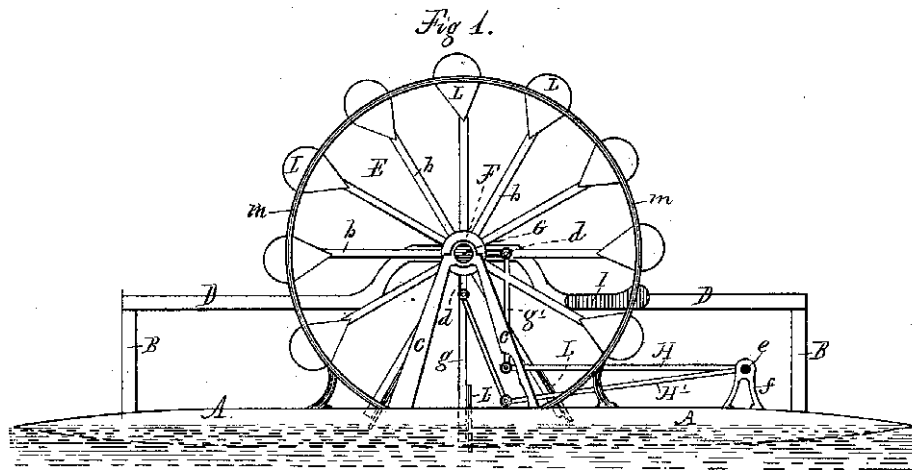
Witnesses:

J. E. HARRIMAN,  
JOHN BATTEUSEK.

W. D. MOORE.  
Water-Velocipede.

No. 206,346.

Patented July 23, 1878.





# UNITED STATES PATENT OFFICE.

WILLIAM D. MOORE, OF NEW YORK, N. Y., ASSIGNOR OF THREE-FOURTHS  
HIS RIGHT TO MARY A. T. ROONEY, MARY E. KOONZE, AND ELIZA TOBIN,  
OF SAME PLACE.

## IMPROVEMENT IN WATER-VELOCIPEDES.

Specification forming part of Letters Patent No. **206,346**, dated July 23, 1878; application filed  
May 9, 1878.

*To all whom it may concern:*

Be it known that I, WILLIAM D. MOORE, of the city, county, and State of New York, have invented certain new and useful Improvements in Water-Velocipedes, of which the following is a specification:

This invention relates to that class of boats which are propelled by means of paddle-wheels operated by manual power. The particular class of such vessels to which my invention belongs has been designated as "water-velocipedes" or "aquapeeds;" and it consists in a certain novel construction of the vessel, and in the mode of propelling and steering the same, all of which will be hereinafter fully pointed out and described.

In the drawings which form an essential part of this specification, Figure 1 represents a side elevation of a boat or vessel in which my invention is fully embodied. Fig. 2 is a plan view of the same; and Figs. 3 and 4 are detached views of the floats or paddles.

The same letters of reference marked on the several figures of the drawings will designate and locate corresponding parts.

Many and varied attempts have been made to produce water-velocipedes or boats arranged to be propelled by manual power; but such efforts have been confined simply to the application, on a modified scale, of the ordinary form of paddle-wheels provided with cranks, or cranks and treadles, and a steering apparatus of the usual nature. This system requires a great exertion of power, much more than an ordinary person can supply, except for a limited period of time, the apparatus, withal, being bulky and costly.

In my present invention I have aimed to provide a light vessel of great buoyant power, provided with two independently-acting propelling paddle-wheels, which are armed with self-acting adjusting-floats, such wheels being so hung and arranged as to be driven by treadles operated by the feet, or by the hands alone, or by the combined use of both. The wheels being detached and independent of each other, one may be operated alone, causing the boat to turn on that side, or one may be operated in a reverse direction, thus giving the operator complete control of the ves-

sel's movements without the intervention or use of a steering apparatus.

A A' designate the body of the vessel or boat, which, practically, is two cigar-shaped air-tight vessels, which may be of wood, paper properly prepared, or of light sheet metal, as mechanical skill may deem the best suited for the purpose. The length and size of these floats and their buoying and sustaining capacity may be increased or decreased, according to circumstances. These two floats are each provided with an upright frame, B, rising from each end, or from near the ends, thereof, which frames support a cross-frame, C C', which, in turn, support longitudinal frames D D', the two latter lying parallel with and close to each other, (see Fig. 2,) and providing a means of securing the two sections together to form the complete vessel, and for supporting the various operating and other parts of the apparatus. The mode of lashing or securing these frames D D' together may be by means of a series of clamps, *a*, or by means of a series of hinges, or in such other manner as may be approved.

Suitable braces and rods may be introduced and used to strengthen and brace the two floats and the framing. Such parts, however, are not shown in the drawing, as their application is obvious, and as they are not the subject of invention.

E E' are the wheels, which consist of a series of rods or shafts, *b*, projecting from a hub, F, which is mounted on a shaft, G, such shaft having its bearings at one end in the frames D D', and at the other end in a standard, C, which rises from the floats A A' for that purpose. These shafts G are shaped so as to form the cranks *d d*, by which the rotary motion is given to the shaft and the wheels.

H H' are the treadles, the rear ends of which are secured to a shaft, *c*, that is supported by, and rocks in, two studs or stands, *f f'*, attached to the floats A A', this shaft also assisting to steady the floats. To the forward end of these treadles the connecting-rods *g g'* are attached, they also being secured to the cranks *d d* in any approved manner, the treadles also being provided with suitable foot-rests *h h'*. Sleeves *i i* are applied to the cranks *d d*, for the pur-

pose of providing a means for grasping and operating them by the hands when desired so to do.

A saddle or seat, I, is provided for the operator, and is secured in place upon the frames D D'. This saddle or seat is located in such position that the treadles and cranks are easily operated, either by means of the feet alone or by both hands and feet at the same time.

Although any of the usual forms of paddles or floats may be applied to the wheels G, yet I prefer the form as shown in the drawings, the floats L being heart-shaped, and secured on the rods or shafts *b* (near their ends) by means of the straps or bearings *k k'*, which are pinned to the floats L, the rods *b* passing through them, thus permitting the floats to turn freely thereon.

The extent of the rotary movement of these floats is determined and governed by a controlling pin or stop, *l*, attached to the rods *b*; but any other suitable mechanical means of applying these floats to the shafts and controlling them may be used. These floats are so adjusted on the shafts that about two-thirds of the surface thereof is thrown to one side of the shafts, the object being to cause these floats to automatically present the full surface as they enter the water, the resistance offered by the water causing them to so act. As the floats leave the water they strike against a guide, *m*, which is attached to the boats A for that purpose. This causes them to turn from their flat position when acting on the water to a position nearly at right angles thereto. This position is best seen in Fig. 1, the dotted lines of the floats immersed indicating their position in the water. The result is that the floats meet with no resistance from the atmosphere, and thus lessening the amount of power required to operate them. The guide *m* may be continued on the curved line described by the floats, and attached to the floats A A', as shown in Fig. 1, so that the paddle-floats are

held in their position from the time they leave the water until they again enter it.

It is plainly evident that seats for passengers may be affixed to the framing; also, that the paddle-wheels may be partially boxed in, so as to keep the water from the operator and passengers; but these, being simply matters of detail in actual construction, are not shown in the drawings. The wheels may be arranged for ready detachment, and the vessel arranged to fold up on the frames D D'.

In some cases this form of boat may be enlarged and its passenger-carrying capacity increased. I therefore do not limit myself to any particular arrangement of seats, or their location on the framing or boats. I also propose to use any other motive power for driving the wheels, combined with the treadle arrangements described, so that either one may be alone used, or both powers combined.

What I claim as my invention is—

1. In combination with a boat or vessel formed in two detachable sections, two independent paddle-wheels, armed with adjustable feathering floats, and arranged for separate operation by treadles and cranks, substantially as herein shown and set forth.

2. The combination, in a sectional boat or vessel, of the floats A A', each having framing B C D, carrying two independent paddle-wheels, E, mounted on crank-shafts G, operating treadles H, and saddle I, all arranged and operating substantially as and for the purposes as herein shown and set forth.

3. The combination of the independent paddle-wheels E, having a series of shafts, *b*, rotating or rocking floats L, and the guide *m*, such guide arranged to "feather" the floats *b* and control them when not immersed in the water, all arranged and operating substantially as herein shown and set forth.

WILLIAM D. MOORE.

Witnesses:

A. L. MUNSON,  
E. G. WARD.



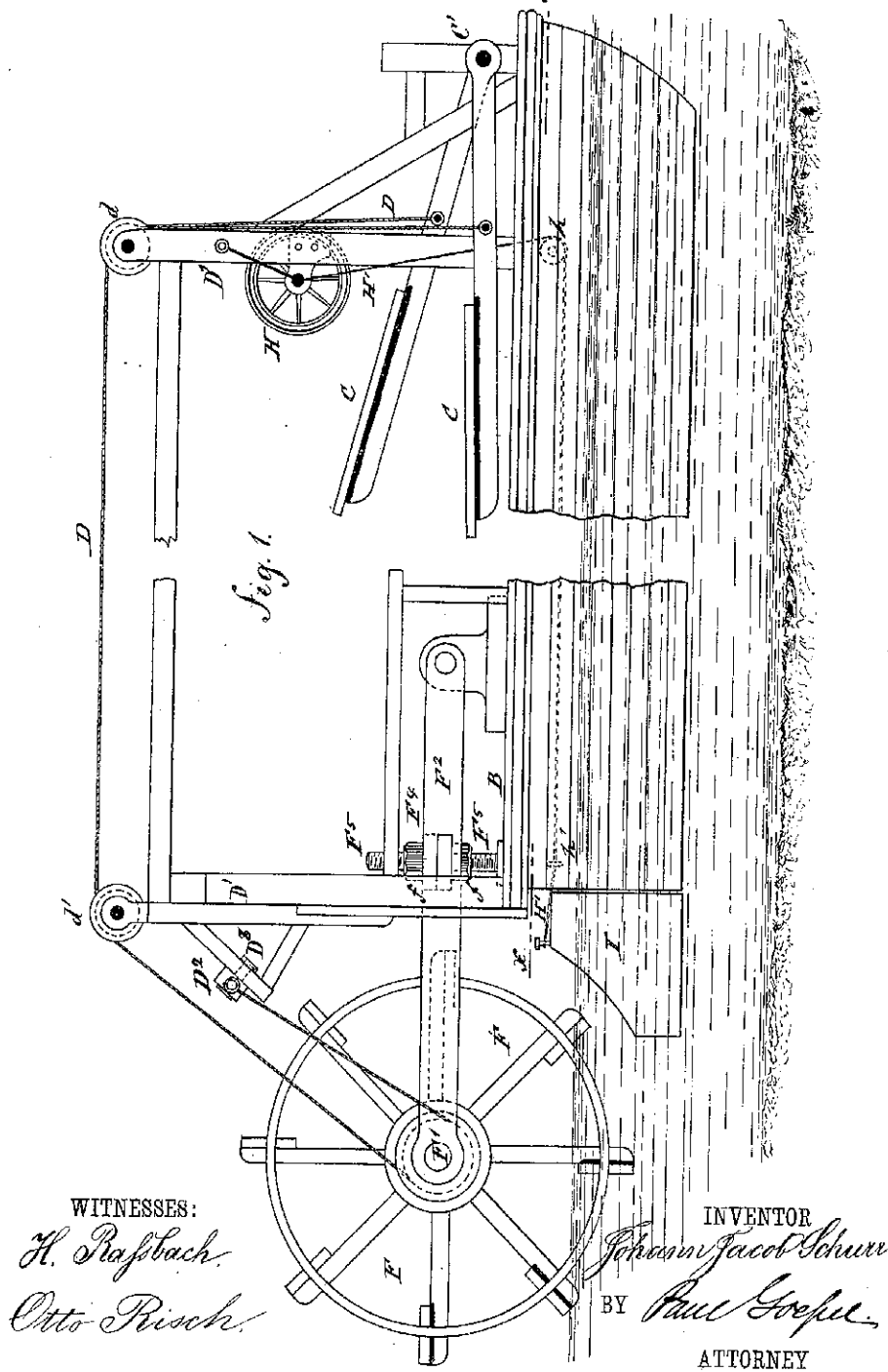
(No Model.)

3 Sheets—Sheet 1.

J. J. SCHURR.  
STERN WHEEL BOAT.

No. 270,344.

Patented Jan. 9, 1883.



(No Model.)

3 Sheets—Sheet 2.

J. J. SCHURR.  
STERN WHEEL BOAT.

No. 270,344.

Patented Jan. 9, 1883.

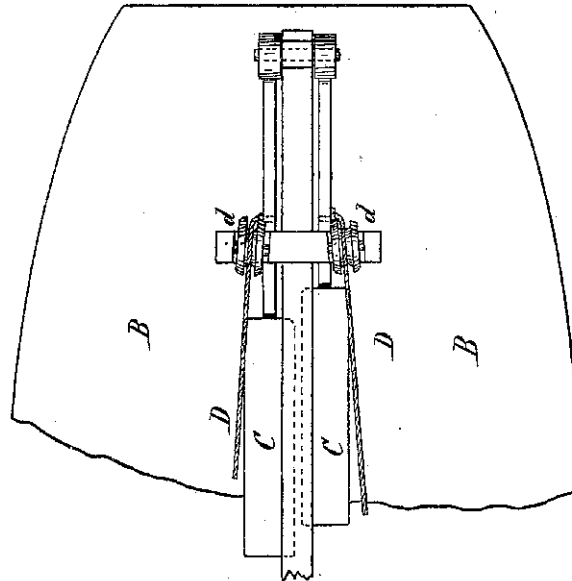
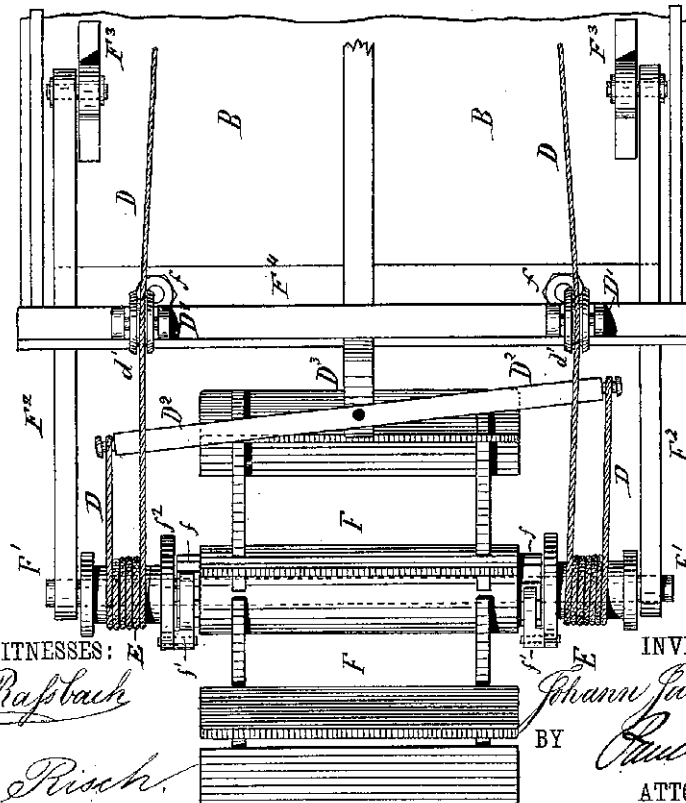


Fig. 2.



WITNESSES:

*H. Rapbach*

*Otto Pisch*

INVENTOR

*Johann Jacob Schurr*

BY

*Rud. Goppel*

ATTORNEY

(No Model.)

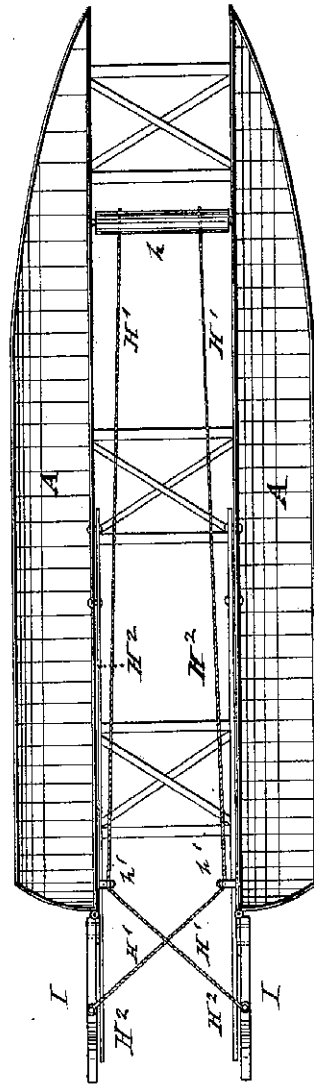
3 Sheets—Sheet 3.

J. J. SCHURR.  
STERN WHEEL BOAT.

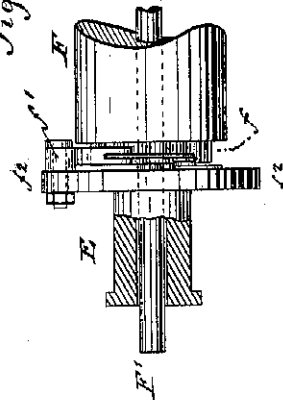
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Patented Jan. 9, 1883.

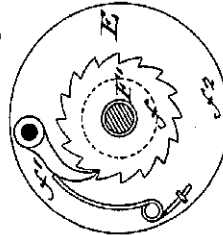
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



WITNESSES:

*H. Raftach*

*Otto Risch*

INVENTOR

*Johann Jacob Schurr*

BY

*Paul Goepfer*

ATTORNEY

# UNITED STATES PATENT OFFICE.

JOHANN J. SCHURR, OF PITTSBURG, PENNSYLVANIA.

## STERN-WHEEL BOAT.

SPECIFICATION forming part of Letters Patent No. 270,844, dated January 9, 1883.

Application filed September 4, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOHANN JACOB SCHURR, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Propelling Vessels, of which the following is a specification.

This invention has reference to an improved mechanism for propelling pleasure-boats, canal-boats, and other vessels; and the invention consists of a boat having a paddle-wheel arranged at its stern, said paddle-wheel receiving continuous rotary motion by means of oscillating treadles which are connected by properly-guided transmitting-cords with loose sheaves on the shaft of the paddle-wheel, said sheaves engaging alternately by pawls pivoted thereto ratchet-wheels on the hub of the wheel. The transmitting-cords are passed several times around the sheaves and connected at their ends to a centrally-fulcrumed oscillating lever, which causes the alternate winding up of one of the transmitting-cords on one sheave while the other cord is unwound from the other sheave. The shaft of the paddle-wheel is supported in backwardly-extending beams, which are pivoted at their inner ends to deck-posts of the boat and provided at intermediate points with vertically-adjustable screw-standards, by which the depth of the wheel in the water may be regulated. The boat is made of two hulls, side by side, laterally braced and connected together, having a central longitudinal channel between them, the rudders being applied to the stern of the hulls and operated by a steering-gear near the treadles and by connecting cords or chains by the party operating the propelling mechanism.

In the accompanying drawings, Figure 1 represents a side elevation of my improved propelling mechanism for vessels. Fig. 2 is a plan view of the same; Fig. 3, a horizontal section on line *x x*, Fig. 1; and Figs. 4 and 5 are details of the pawl-and-ratchet mechanism by which rotary motion is transmitted from the sheaves to the paddle-wheel.

Similar letters of reference indicate corresponding parts.

In the drawings, A A represent the hull of a vessel constructed of two hulls, which are pointed at the bows and laterally connected

by strong braces, so as to form a central longitudinal passage-way for the water. The hulls A A support the deck B, on which the propelling mechanism is arranged. This consists of two oscillating treadles, C C, which are pivoted to a fixed deck-post, C', near the bow. A power-transmitting cord, D, is attached to each treadle and guided over pulleys *d d'*, that are supported on vertical posts D' D', one pair near the treadle, the other at the stern of the boat, as shown in Fig. 2. The pulley-supporting posts D' D' are properly stiffened by longitudinal and lateral brace-pieces. The transmitting-cords D pass from the stern-pulleys *d' d'* downward and around loose sheaves E of the paddle-wheel shafts, one at each side of the paddle-wheel F. After passing a number of times around the sheaves E the cords D are attached to the ends of an oscillating lever, D<sup>2</sup>, that is centrally fulcrumed to an inclined bracket-frame, D<sup>3</sup>, secured to the transverse brace-frame of the stern-posts D', as clearly shown in Figs. 1 and 2. The hub of the paddle-wheel F is keyed to the shaft F', and provided at both ends with fixed ratchet-wheels *f*. These ratchet-wheels are alternately engaged by spring-pressed pawls *f'*, applied to a disk-shaped flange, *f''*, at that end of the sheaves adjoining the hub of the paddle-wheel. By the alternating action of the treadles one of the transmitting-cords causes the turning of its sheave in the forward direction, so that its pawl engages one of the ratchet-wheels of the hub and imparts thereby rotary motion to the paddle-wheel F. The strain exerted by the unwinding of the cord D on the fulcrumed lever D<sup>2</sup> pulls the same toward the sheave that has just turned the paddle-wheel. The opposite end of the lever D<sup>2</sup> exerts thereby a strain on the second cord D, which causes the second sheave to turn, but in opposite direction to that of the first sheave, so that its pawl passes clear over the teeth of the adjoining ratchet on the hub of the paddle-wheel, and causes the winding up of the transmitting-cord D on the sheave and the raising of its treadle C, so that it is ready to be lowered by the action of the party propelling the boat. By lowering the treadle just raised the transmitting-cord D, attached to the treadle, causes the turning of the sheave that has just moved clear of the

ratchet-wheel on the hub of the paddle-wheel in forward direction, so that its pawl engages the ratchet-wheel and imparts thereby a rotary motion to the paddle-wheel, while the sheave and pawl at the other end of the paddle-wheel shaft turn clear of the ratchet-wheel by the action of the oscillating lever D', so as to wind up its transmitting-cord and raise thereby the first treadle, C, again. In this manner the alternating lowering and raising of the treadles produces a continuous rotary motion of the paddle-wheel in one direction, as the transmitting-cords cause the alternate engagement and disengagement of the pawls of the sheaves with the ratchet-wheel of the hub of the paddle-wheel in connection with the oscillating motion of the lever D', that is actuated by the transmitting-cords D D. In this manner the boat can be propelled with comparatively little effort by the party or parties working the treadles.

The shaft F' of the paddle-wheel F revolves in bearings at the ends of longitudinal beams F<sup>2</sup>, which are pivoted at their front ends to fixed deck-posts F<sup>3</sup>, and extended to sufficient length back of the stern B. The beams F<sup>2</sup> are connected by a transverse stiffening-piece, F<sup>4</sup>, which is supported on vertical screw-standards F<sup>5</sup>, by which the pivoted beams F<sup>2</sup> may be set higher or lower, they being then secured rigidly in position by tightening screw-nuts f f, so that the paddle-wheel may be made to dip more or less into the water according to the greater or less load of the boat.

In place of the treadle action any other means by which the transmitting-cords are alternately actuated—such as an oscillating lever—may be employed, as I do not confine myself to the special mechanism described.

The propelling mechanism of the boat may also be worked by steam-power, if desired.

The boat is steered from a steering mechanism arranged near the treadles, so that the person working the treadles can also operate the steering mechanism. It consists of a lever

or steering-wheel, H, that is connected by two transmitting-cords, H', which pass over a guide-roller, h, between the hulls, and over pulleys or eyes h' to the rudders I I at the stern of the same, as shown in Figs. 1 and 3. The rudders are simultaneously operated parallel to each other, they being acted upon at their insides by strong springs H<sup>2</sup>, (shown in Fig. 3.) whereby the return motion of the same is facilitated.

The advantages of my improved propelling mechanism for vessels are that the vessels can be propelled with greater speed and with less effort; secondly, that the vessel, being built of two hulls, cannot capsize, so as to furnish thereby greater security; thirdly, that owing to the large deck which can be arranged on the hulls a large number of persons or a large quantity of freight can be carried by the vessel.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a boat having two hulls arranged side by side, of a vertically-adjustable paddle-wheel located at the stern of the boat, alternately-working treadle, power-transmitting cords, loose sheaves on the shaft of the said paddle-wheel connected by pawl-and-ratchet mechanism with the hub of the wheel, and the fulcrumed lever, whereby a continuous rotary motion is imparted to the paddle-wheel, substantially as described.

2. The combination, with a boat having two hulls, of a steering mechanism consisting of a rudder at the stern of each hull, a steering-wheel at the bow, intermediate cords and pulleys, and springs for facilitating the return motion of the rudders, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOHANN JACOB SCHURR.

Witnesses:

JOSIAH COHEN,

HARRISON H. LIVINGSTON.





(No Model.)

S. HAGEN.  
FOOT BOAT.

No. 319,242.

Patented June 2, 1885.

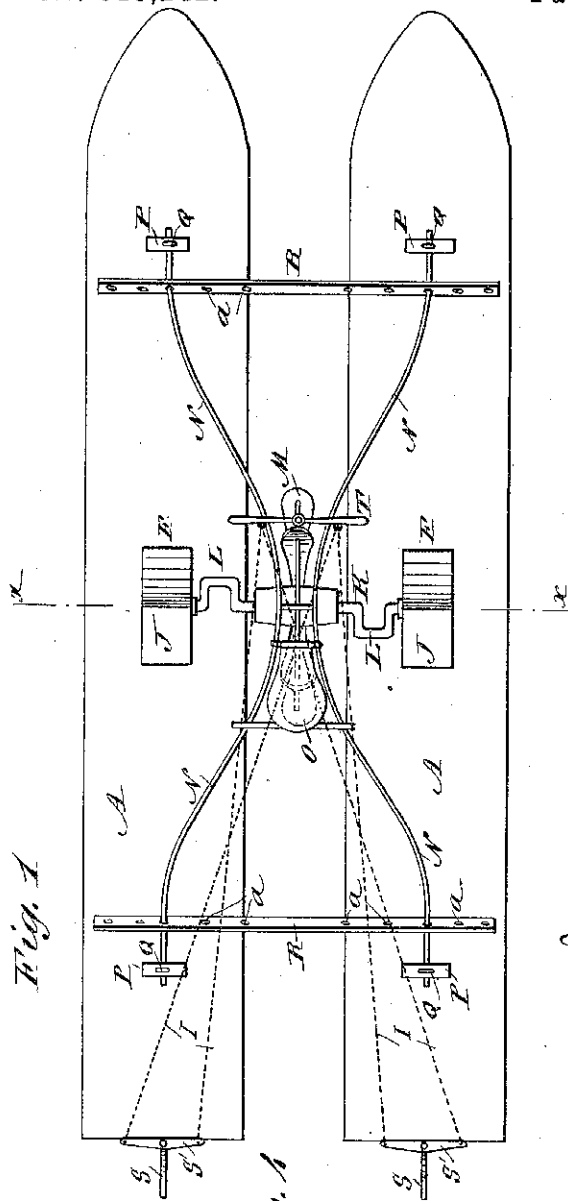


Fig. 1

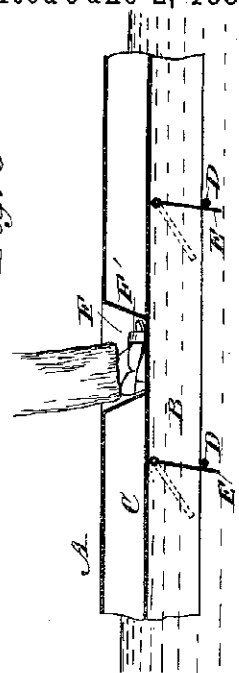


Fig. 3

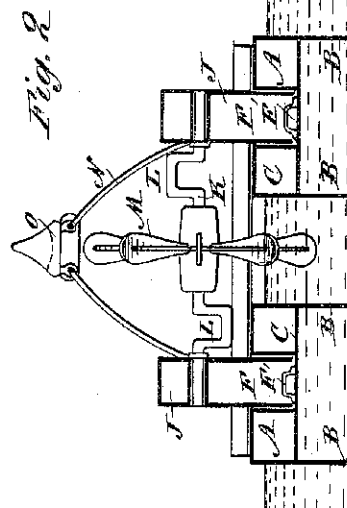
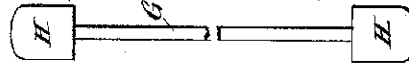


Fig. 2

WITNESSES:

*C. Neveu*  
*W. Bedynick*

Fig. 1



INVENTOR:

*S. Hagen*  
*Munn & Co*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

SIVERT HAGEN, OF NEW BRIGHTON, NEW YORK.

## FOOT-BOAT.

SPECIFICATION forming part of Letters Patent No. 319,242, dated June 2, 1885.

Application filed February 6, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, SIVERT HAGEN, of New Brighton, Richmond county, New York, have invented a new and Improved Foot-Boat, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved foot-boat, which can be strapped on the foot in the same manner as a shoe, and can be used to travel on the water, and of which foot-boats two can be united and provided with a paddle-wheel to form a catamaran-velocipede.

The invention consists in the construction, arrangement, and combination of parts and details, as will be fully set forth hereinafter, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 shows two of my improved foot-boats united to form a catamaran-velocipede. Fig. 2 is a cross-sectional elevation of the same on the line *x x*, Fig. 1. Fig. 3 is a longitudinal sectional elevation of one foot-boat, showing the receptacle for the foot. Fig. 4 is a longitudinal view of the rod for propelling the foot-boat.

Each foot-boat consists of a water-tight long box, A, tapered at the front, and having its sides B extended below the bottom C, the sides B being united at the bottom edges by cross-rods D, above which wings E or blades are pivoted between the sides B at the bottom of the boat, the said blades or wings being adapted to swing toward the rear and against the under side of the bottom of the boat. In the deck or top of each boat a recess, F, is formed for receiving the foot, and on the bottom of the recesses straps form loops F' for receiving the foot. Each foot is placed in the recess F of one boat, and the person uses a pole or rod, G, having a cork ball, H, or a hollow sheet-metal ball on each end. One end of the rod is placed on the surface of the water, and, being buoyant, offers resistance, and the boat can be propelled by pushing on the rod or pole.

To construct a catamaran-velocipede, a frame, J, is placed in each recess F, and in the said

frames the ends of a shaft, K, are journaled, which is provided with the two opposite cranks L, between which a paddle-wheel, M, of any desired suitable construction, is mounted on the crank-shaft. Two curved rods or bars, N, are united at their middles by a seat, O, and the ends of the rods are passed into pockets P on the tops of the boats A at the ends, and the ends of the rods are held in the pockets P by binding-screws Q. The rods or bars N are united near the ends by cross-bars R, having a series of apertures, *a*, through which the rods or bars N are passed. The boats can thus be adjusted a greater or less distance from each other by passing the rods or bars through apertures *a* greater or less distances from the ends of the bars R.

On the stern end of each boat A a rudder, S, is pivoted, each having a cross-piece, S', connected by chains, wires, or cords I with the steering-lever T, pivoted in front of the seat O. The person occupies the seat O, and by means of the cranks L revolves the paddle-wheel M and propels the catamaran.

The boats A may be made of wood or metal, and as their sides project below the bottom they are provided with double keels, which prevent them from tilting.

If desired, bars may project from the bottom of the boat, against which bars the blades or wings E can rest when swung toward the front, the rods D being dispensed with. When the boats move forward, the wings move upward and offer no resistance, but when a back-pressure is exerted on one boat by one foot the wings of the said boat swing against the rods D and offer sufficient resistance to permit pushing the other boat and foot forward.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a combined foot-boat and catamaran, the foot-boats having foot-recesses, pockets near the opposite ends of the said foot-boats, and set-screws, the removable frames fitting in said foot recesses, the operating mechanism secured thereto, and the removable longitudinal rods united at or near their centers by a seat-frame, and having their ends secured in the pockets by the set-screws.

2. In a combined catamaran and foot-boat, the combination, with the foot-boats, a remov-

able operating mechanism connecting them, of  
the longitudinal bars connected at or near their  
centers by a seat-frame and removably con-  
nected at their ends to the opposite ends of  
5 the foot-boats, and bars connecting said lon-  
gitudinal rods near their ends, said bars hav-  
ing a series of perforations, through which  
said rods may be passed for adjusting the dis-  
tance between said boats, substantially as set  
10 forth.

screws Q, the removable frames J, fitting with- 15  
in the foot-recesses, crank-axle K L, connect-  
ing said frames and paddle-wheel on said axle,  
the longitudinal rods N N, seat-frame O, and  
steering-lever T at the central parts of said  
rods, connecting cords or chains I between 20  
the rudders and steering-lever, and the per-  
forated bars R at opposite ends of the rods N,  
for adjusting the distance between the boats,  
substantially as set forth.



(No Model.)

2 Sheets—Sheet 1.

F. J. & W. H. ROSS.  
VELOCIPEDE BOAT.

No. 380,221.

Patented Mar. 27, 1888.

FIG. 1.

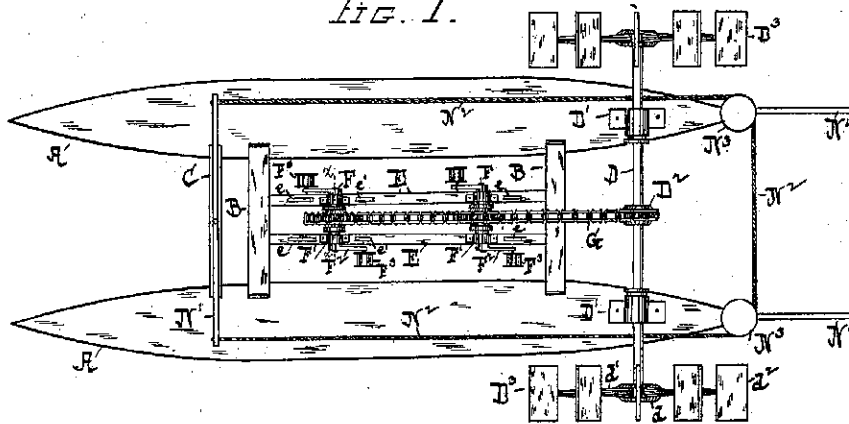
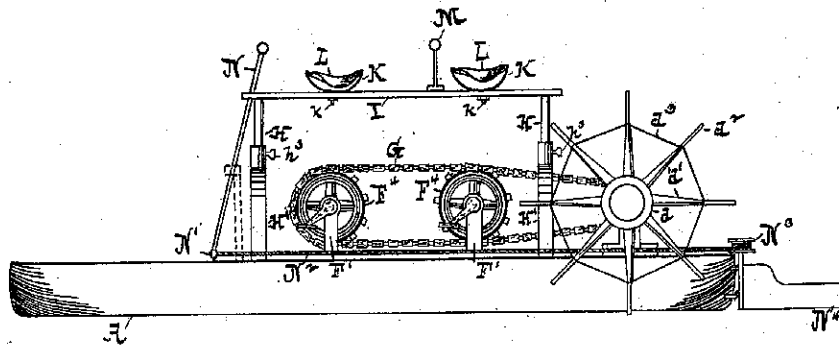


FIG. 2.



Witnesses—

H. Gardner  
R. T. Chapman.

Inventor—

F. J. Ross.  
W. H. Ross.  
By R. T. Chapman  
Attorneys.

F. J. & W. H. ROSS.  
VELOCIPED BOAT.

No. 380,221.

Patented Mar. 27, 1888.

FIG. 3.

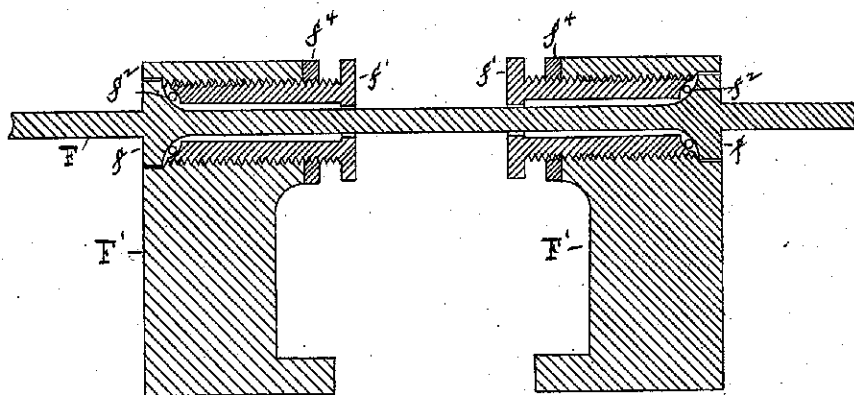


FIG. 4.

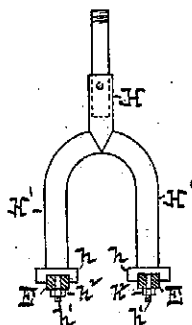


FIG. 5.

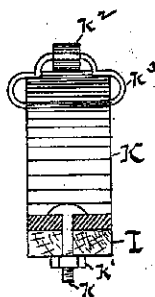


FIG. 6.

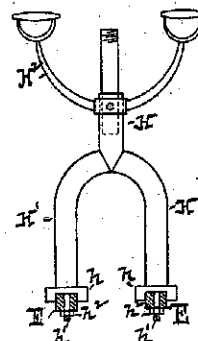
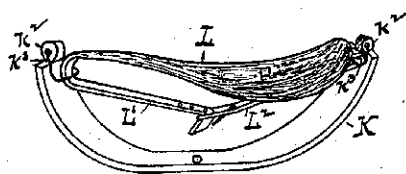


FIG. 7.



Witnesses—

H. Gardner.

H. T. Chapman.

Inventor—

F. J. Ross.

W. H. Ross.

By H. T. Chapman  
Attorneys.

# UNITED STATES PATENT OFFICE.

FREDERICK J. ROSS AND WILLIAM H. ROSS, OF SOUTH HADLEY FALLS,  
MASSACHUSETTS.

## VELOCIPED-BOAT.

SPECIFICATION forming part of Letters Patent No. 380,221, dated March 27, 1888.

Application filed October 23, 1887. Serial No. 253,093. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERICK J. ROSS  
and WILLIAM H. ROSS, of South Hadley Falls,

extends transversely across them near their  
rear ends, being journaled in bearings D', the  
particular construction of which will be pres-



duced to a minimum, said shafts being supported laterally with respect to the hulls A A, as well as vertically, by the balls  $f'$ .

Midway between the rails E E each of the crank-shafts is provided with a sprocket-wheel,  $F^4$ , which wheels are preferably of the same diameter, and upon the wheel-shaft, in alignment with said wheels  $F^4$ , is a third sprocket-wheel,  $D^2$ , preferably of one-half the diameter of said wheels. A chain belt, G, having links of the proper size to receive the teeth on said wheels, passes around the front wheel  $F^4$  and wheel  $D^2$  and over and beneath the rear wheel  $F^4$ , whereby motion is transmitted from both wheels  $F^4$  to wheel  $D^2$  and the wheel-shaft, said latter shaft making two revolutions to each revolution of the crank-shafts.

The standards which support the seat-bar are preferably made from metal tubing, and consist of a main stem, H, having two outwardly and downwardly curved arms,  $H'$ , which are provided at their lower ends with feet  $h$ , in each of which is a groove to receive one of the rails E. The arms  $H'$  are also provided with downwardly projecting bolts  $h'$ , which extend through slots  $e$  in the rails E, and receive beneath said rails nuts  $h'$ . The slots  $e$  in the rails are located immediately in front and rear of the bearings for the crank-shafts, and by loosening the nuts  $h'$  the standards can be adjusted toward and away from said crank-shafts to suit the convenience of the riders. In order to provide for vertical adjustment of the seat-bar, we prefer to make the main stem H of the standards in two parts, one sliding within the other, as shown in Figs. 2, 4, and 6, and to provide the lower member with a set-screw,  $h^2$ , by means of which the upper member can be secured in different positions within said lower member. The seat-bar I is secured in any convenient manner upon the upper ends of the upper members of the standards.

The saddle-hangers K consist of upwardly curved plates secured to the seat-bar by bolts  $k$ , passing through said plates and bar, and nuts  $k'$ , turned on said bolts beneath the bar, as shown, or in any other convenient manner. Said hangers are provided at each end with an ear,  $k^2$ , in each of which is pivoted a loop,  $k^3$ , as shown in Figs. 5 and 7. The saddles L preferably have their front end extended to form a strap,  $L'$ , and have secured to their lower side, near their rear end, a strap,  $L^2$ , one of which straps is provided with a buckle at its free end and the other with holes to receive the tongue of said buckle, as shown. By passing strap  $L'$  through the front loop,  $k^3$ , and strap  $L^2$  through the rear loop, as shown in Fig. 7, and connecting the ends of the straps together by means of the buckle, the saddle is suspended within the hanger in such manner as to yield to the movements of the rider when operating the pedal-cranks and afford an easy seat. The saddle can be made more or less rigid with respect to the hanger by tightening or loosening

the straps  $L'$   $L^2$ . A handle-bar, M, secured to the seat-bar in front of the rear saddle, enables the rear rider to steady himself in his seat, while the front rider grasps a similar handle-bar secured to the top of the steering-rod N and steers the boat. The steering-rod N near its upper end rests in an open bearing in the front end of the seat-bar, and at its lower end is rigidly secured to a bar,  $N'$ , midway between the ends of the latter. Said bar  $N'$  is centrally pivoted upon cross-bar C, and has secured to each end one end of the cord or rope  $N^2$ , which passes around the grooved pulleys  $N^3$  at the top of the tiller-posts of the rudders  $N^4$ , at the end of the hulls, as shown in Fig. 1. It will be obvious without further description that axial movement of rod N by means of its handle-bar will turn both rudders in one or the other direction to change the course of the boat. As thus far described the boat is adapted for use by male riders only; but it can be quickly changed, so that a lady can occupy the front seat while a gentleman sits behind and propels the boat, by removing the seat-bar, securing the saddle-hangers directly to the top of the standards H, and removing the front standard to the rear of the front crank-shaft, slots  $e'$  being made in the rails E E at that point for this purpose. When this is done, we prefer to provide each of the standards with a handle-bar,  $H^2$ , as shown in Fig. 6, secured to the main stem of the standard by means of a collar surrounding the same and having upwardly curved arms, whereby a support is afforded upon either side of the saddle. A foot-rest will also be secured to the front cross-bar, B, as indicated by broken lines in Fig. 2, which will also serve as a support for the steering-rod in lieu of the seat-bar.

The wheel-shaft D is preferably tubular in form, and has secured to each end thereof a paddle-wheel,  $D^3$ , composed of the hubs  $d$ , spokes  $d'$ , and blades  $d''$ , the spokes being braced by a wire,  $d''$ , which may be continuous around the wheel, as shown, or composed of separate sections between each pair of spokes. A very light but strong wheel is thus afforded, and the combined operation of said wheels, which make two revolutions to one of the crank-shafts, enables the boat to be driven at high speed with but little exertion on the part of the riders.

The boat thus constructed can be made very cheaply and yet answer all the purposes of similar boats heretofore made, which are much more complicated and expensive in structure.

We do not wish to limit ourselves to the use of two crank-shafts, as the number that could be employed in addition to the two shown is limited only by the size of the boat. It is obvious, also, that other modifications in the details of construction shown and described could be made without departing from the spirit of our invention.

Having thus fully described our invention,

what we claim, and desire to secure by Letters Patent, is—

1. A velocipede-boat consisting of the hulls A A, a frame connecting one of said hulls with the other, a plurality of pedal-crank shafts mounted in bearings upon said frame, seats secured upon said frame adjacent to said shafts, a shaft having a paddle-wheel secured to each of its ends mounted in bearings upon said hulls, belt-connections between each of said crank-shafts and said wheel-shaft, rudders secured to said hulls, a steering-lever located in front of the first crank-shaft, and intermediate connections between said lever and both of said rudders, substantially as described, whereby said rudders can be operated in unison from the lever, substantially as set forth.

2. In a velocipede-boat, the combination, with hulls A A, having paddle-wheel shaft D, mounted in bearings thereon, of cross-bars B B, rails E E, extending between said bars, two or more pedal-crank shafts mounted in bearings upon said rails, standards H, adjustably secured to said rails, bar I, connected at each end to one of said standards, saddles L, mounted upon said bar I, sprocket-wheels secured to each of the crank-shafts and to the wheel-shaft, and belt G, connecting all of said sprocket-wheels together, substantially as set forth.

3. In the velocipede-boat herein described, the combination, with seat-bar I, supported substantially in the manner set forth, of the bow-shaped hangers K, secured to said bar, said hangers having the loops  $k^2$  at their ends, and saddles L, having the straps  $L^1$   $L^2$ , whereby they are adapted to be suspended between the loops on said hangers, substantially as described.

4. The combination, with the hulls A A, of

bar N', pivoted centrally between said hulls, rod N, secured at one end to said bar, rudders N', having grooved pulleys N<sup>3</sup>, secured to their tiller-posts, and cord or rope N<sup>2</sup>, secured at each end to opposite ends of bar N', and passing around each of said pulleys, substantially as and for the purpose described.

5. In the velocipede-boat herein described, the combination, with hulls A A, having the intermediate connecting-frame composed of bars B and rails E, of uprights F', secured to said rails, each of said uprights containing a bore of greater diameter at one end than at the other, and screw-threaded throughout the portion of lesser diameter, shafts F, having hubs  $f$  thereon, the surface of one side of which is curved, as shown, bushings  $f'$ , screwed into the bore of said uprights and having their inner ends concaved, and balls  $f^2$ , located between the ends of said bushings and the curved surfaces of the hubs on the shafts, arranged and operating substantially as and for the purpose set forth.

6. The combination, with hulls A A, cross-bars B B, and rails E E, having slots  $e$  therein, of standards H, composed of two members, one of which is vertically adjustable within the other, and having the curved arms H', secured to rails E by bolts passing through the slots in the latter, and seat-bar I, secured to the upper members of said standards, substantially as described, whereby provision is made for adjusting said seat-bar both vertically and longitudinally, for the purpose set forth.

FREDERICK J. ROSS.

WILLIAM H. ROSS.

Witnesses:

W. H. CHAPMAN,

T. M. BROWN.

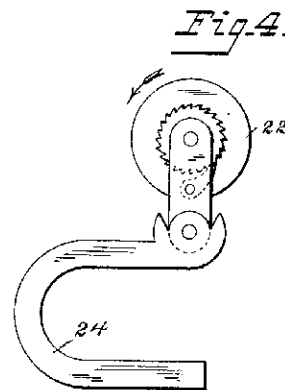
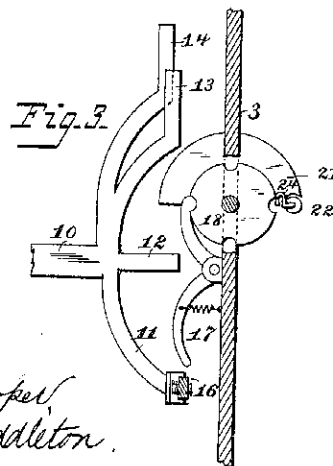
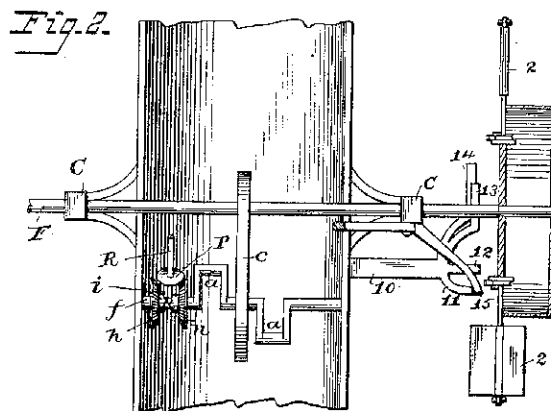
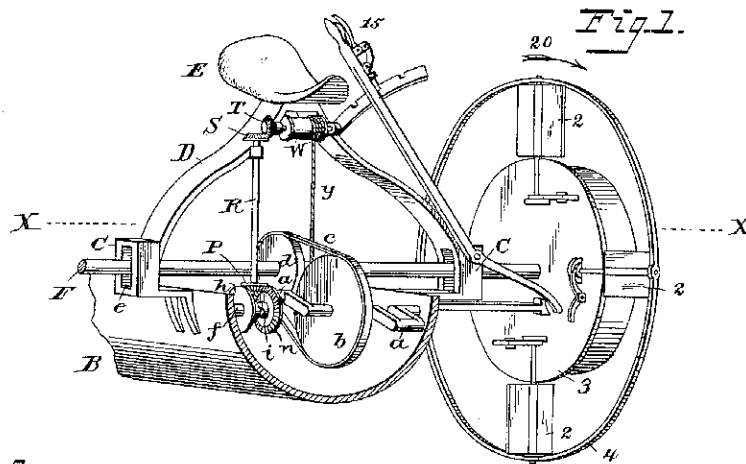


(No Model.)

P. E. COLLINS.  
BOAT PROPELLING MECHANISM.

No. 398,703.

Patented Feb. 26, 1889.



Attest:  
Court A. Cooper,  
F. L. Middleton.

Inventor:  
Paul E. Collins  
by Joyce Spear  
Atty

# UNITED STATES PATENT OFFICE.

PAUL E. COLLINS, OF LYNN, MASSACHUSETTS.

## BOAT-PROPELLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 398,703, dated February 26, 1889.

Application filed April 26, 1884. Renewed August 16, 1886. Serial No. 211,070. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL E. COLLINS, of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Boat-Propelling Mechanism, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to boat-propelling mechanism; and it consists in the devices and combinations of devices hereinafter fully set forth and particularly claimed.

In the accompanying drawings, Figure 1 is a perspective view of a section of a boat, a paddle-wheel and its feathering-paddles, the mechanism for regulating the movements of the paddles, the mechanism for propelling the wheels, and fully illustrates the general manner in which the said several parts are organized and combined together. Fig. 2 is a plan of a section of the parts shown in Fig. 1, the section being made on line *x x*. Figs. 3 and 4 are side views of certain detached parts of the mechanism made on an enlarged scale, and to be more fully described hereinafter.

any or by reason of the air-chambers, a spiral spring (not shown) is placed in the box C, with one end bearing upward against the box and the opposite end bearing down on the shaft. This spring needs, of course, to be only strong enough to overcome the buoyancy of the wheels and air-chambers.

By reference to Fig. 1 it will be observed that the paddles 2 2 2, &c., have their tangs arranged to turn in suitable bearings or grooves in the plate 3, while their outer ends are connected by the band 4. Each paddle is constructed with more area on one than on the other side of the line intersecting its pivoted points, and the side with the larger area being allowed to enter the water first the action of the water will effect a half-turn of the paddle, allowing it to come out of the water edgewise. Paddles adapted to operate in this manner are not new; but the combination of such paddles with the plate 3 has not, to my knowledge, ever been used prior to my invention thereof. The objects of such a plate are to avoid the lifting of water incident to and necessarily done by the arms of the ordinary

over the wheel is made to revolve rapidly whenever it is far into the water. In this way much power is lost, as the paddle fails to take hold of the water at the very moment when its work would be the most effective in driving the boat. To obviate this difficulty I have provided a locking mechanism adapted to engage and hold the paddle till it reaches the desired point for work, and then releases the same to permit the quarter-turn, and then firmly holds it again until it passes the working-point, and again releases it as it commences to lift water, and allows it to further turn and come out of the water edgewise.

15 The several parts which together compose 18, and the paddle is turned by the action of the water till the pawl 17 drops into the next notch in the wheel 18. This brings the paddle at right angles to the body of the boat and into the proper position for work. It is desirable that the paddle should attain this position as quickly as possible after it reaches the point for effective work, and the arm 11 should be located accordingly, and to further hasten the operation of the paddle, as well as to insure its turning in the right direction, the edge of the paddle should be slightly beveled. The paddle should remain in the position stated until it passes to that part on the opposite side of the wheel where work

particular notch. It then falls into the other notches, where it will be lifted by the other arms, 12 13. The cam 21 carries on one end a small wheel, 22. Said wheel is mounted upon a curved arm, 24, as fully illustrated on an enlarged scale in Fig. 4 of the drawings. The manner of combining this with the cam 21 is better shown in Fig. 3. The purpose of this wheel is, in part, to avoid the friction at the point where the cam is about to leave the arm 14, and for this purpose it is allowed to turn in one direction, being prevented from turning in the opposite direction by means of the pawl and ratchet shown in Fig. 4. This wheel, whenever the paddle-wheel is revolved in the direction opposite to that indicated by the arrow 20, and described above, comes first into contact with the end arm, 14, and yields downward slightly, the arm 24 being for this purpose adapted to spring slightly downward, and in this manner the straining and possible breaking of parts is avoided, that might otherwise occur while the pawl 17 is coming into engagement with the arm 13, to be lifted thereby, and allow the paddle to be reversed into position for entering the water, and the paddle in passing the arms 12 11 will be operated, as before described.

I claim—

1. The combination, with a boat, of the outriggers forming a bearing for the shaft F, the paddle-wheels consisting of air-tight chambers and outer rings, the paddles having bearings in the plate 3 and the said ring, and means, substantially as described, for operating said wheels to propel the boat, substantially as described.

2. The combination, with the boat, of the paddle-wheels consisting of air-tight chamber and ring, movable feathering-paddles between said chamber and ring, and means, substantially as described, under the control of the operator adapted to engage said paddles and hold the same during a part revolution of the wheel, and means, as described, to automatically release the same, substantially as set forth.

3. The combination of a wheel having movable feathering-paddles, substantially as de-

scribed, the wheel 18, connected to the shaft 50 of the paddle and notched as described, the pawl 17, pivoted to the plate 3, one end thereof engaging with the notches of the wheel 18, and means, substantially as described, adapted to engage the passage end of said pawl intermittently and lift the same to release the wheel 18, substantially as described.

4. In a boat of the class described, the arm 10, connected to the boat and extending horizontally outward, having a branch, 11, and the lever 15, having the stud 16, combined with the wheel 18 and pawl 17, whereby in the revolution of the paddle-wheel the said pawl 17, holding the paddle-blade, comes in contact with the stud 16, thereby acting upon the wheel 18 to turn the paddle, substantially as described.

5. The combination, in a boat of the class described, of the shaft carrying the paddle-wheels, the air-tight chambers having face-plate 3, and the ring 4, of larger diameter than the plate 3 and in line therewith, the said plate and ring forming bearings for feathering paddle-blades having their movement between the plate 3 and ring 4, substantially as described.

6. In a boat of the class described, having the arm 10 connected thereto, with branch arms 12, 13, and 14, the combination of the wheel 18, pawl 17, and cam 21, carried by the plate 3, whereby when the said cam 21 strikes the arm 14 the said pawl 17 is lifted by the arm 13, thus allowing the cam to roll in passing the end of the arm 14 and effecting the half-turn of the paddle-blade.

7. The combination, in a boat of the class described, with the arm 10, having the branch 14, of the plate 3, carrying the wheel 18, pawl 17, and cam 21, with its spring-arm 24 and wheel 22, whereby the friction is avoided in the movement of the cam 21 over the arm 14 and straining prevented by the action of the spring-arm 24, substantially as described.

PAUL E. COLLINS.

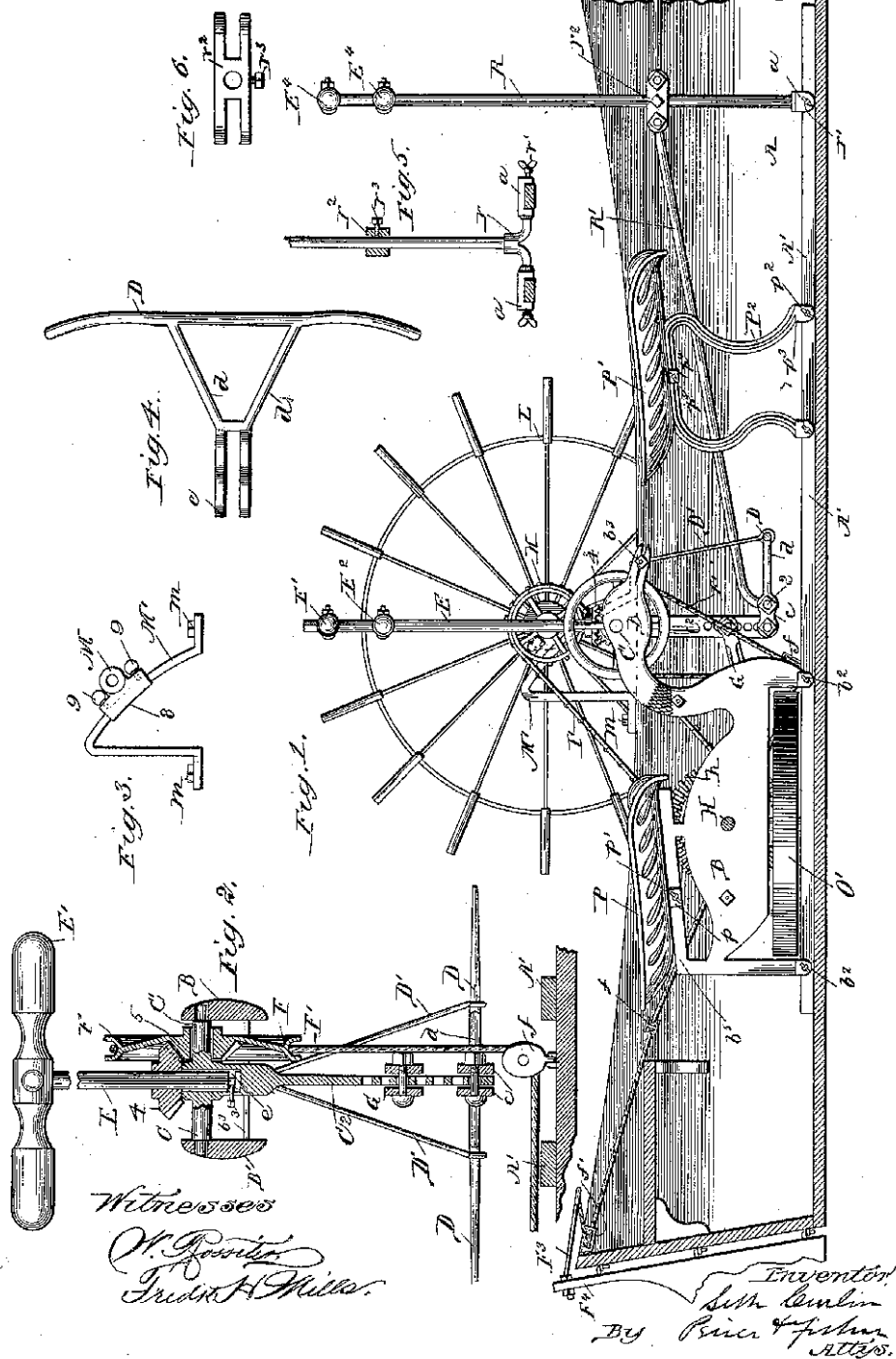
In presence of—

D. A. SANBORN,  
C. B. TUTTLE.

4 Sheets—Sheet 1.

MARINE VELOCIPED.

Patented Apr. 23, 1889.





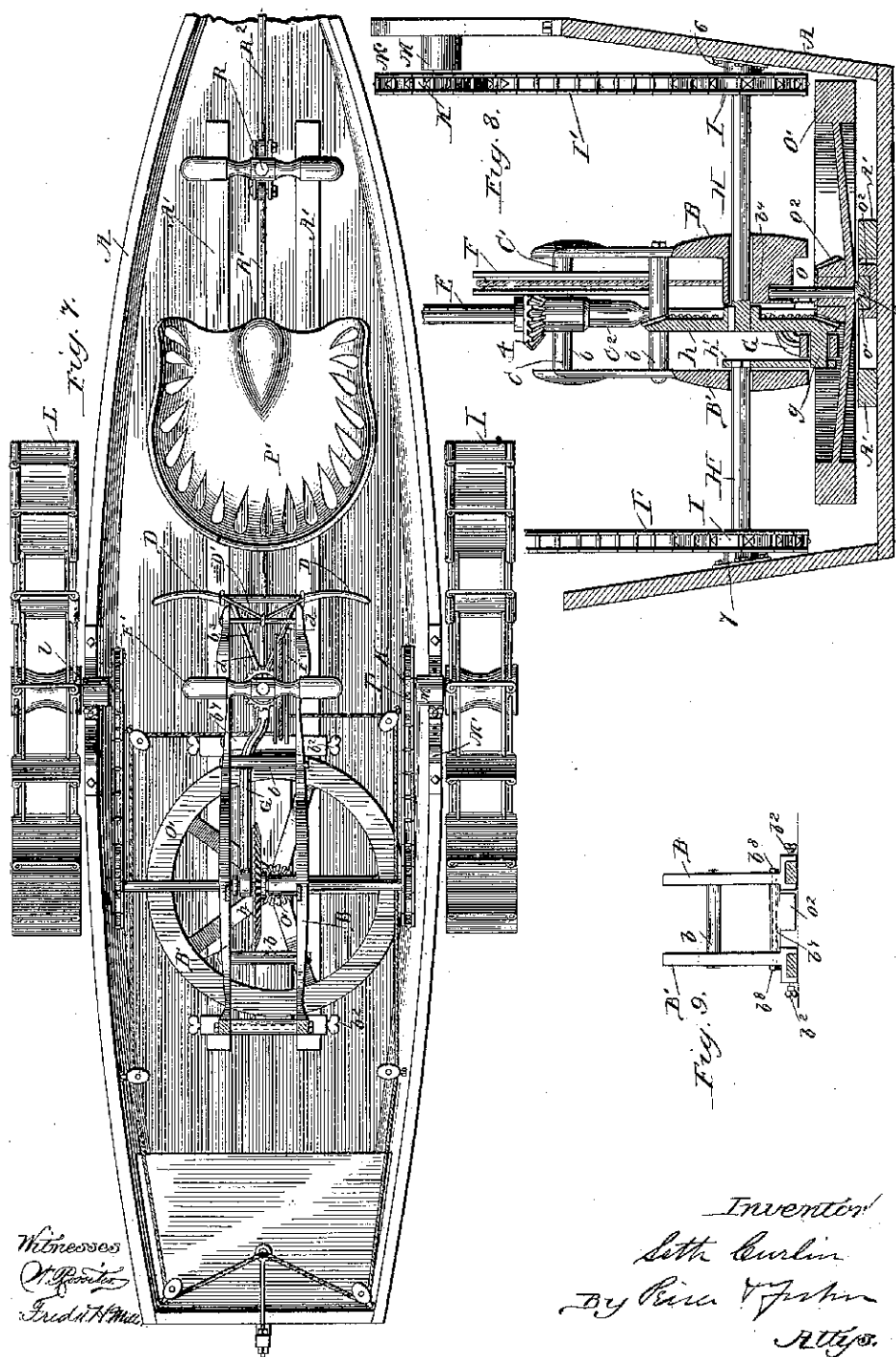
(No Model.)

4 Sheets—Sheet 2.

S. CURLIN.  
MARINE VELOCIPEDE.

No. 401,736.

Patented Apr. 23, 1889.



Witnesses  
*W. B. Smith*  
*Frederick H. Allen*

Inventor  
*Seth Curlin*  
By *Ben. V. Johnson*  
Atty.

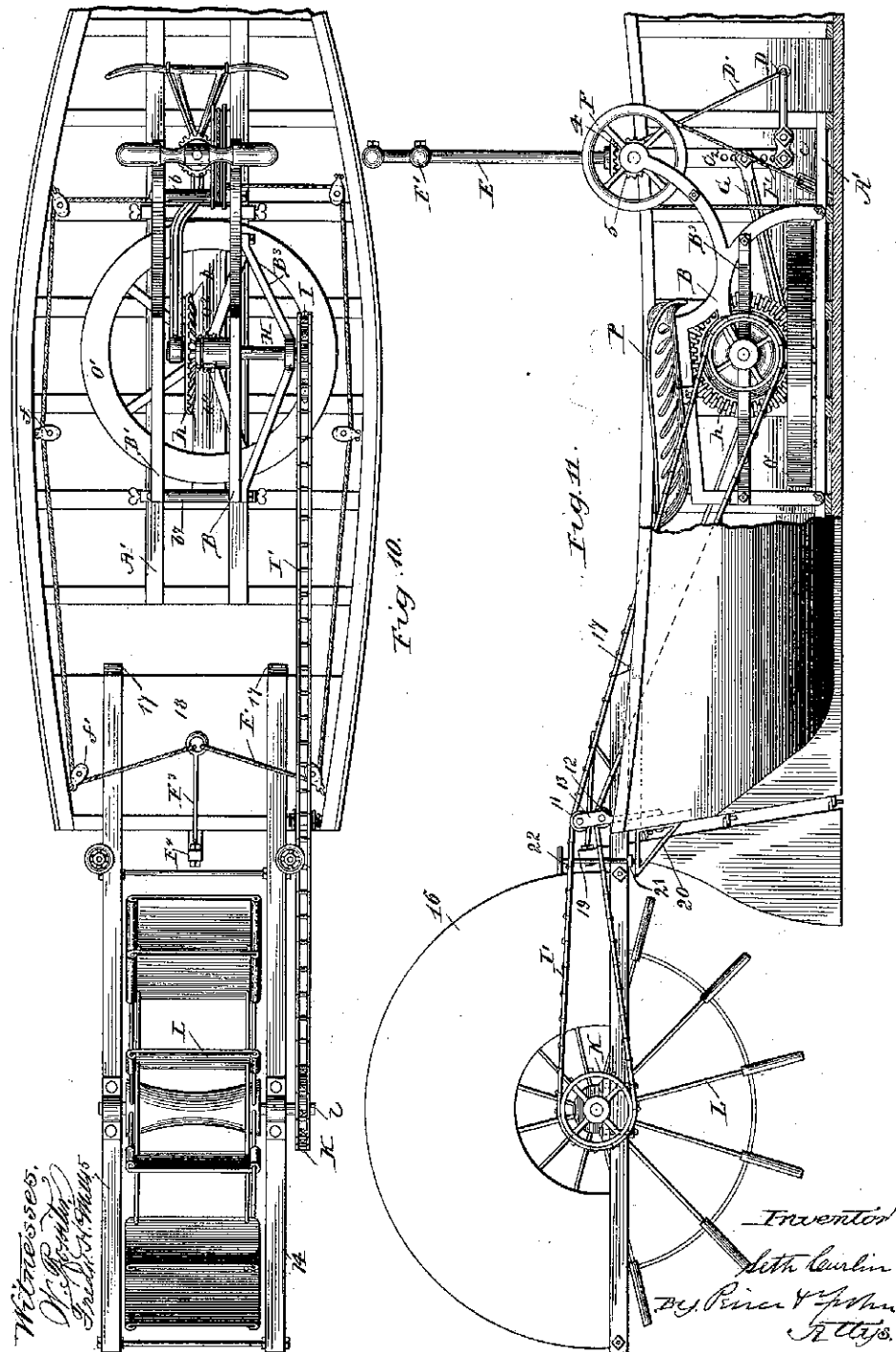
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S. CURLIN.  
MARINE VELOCIPEDE.

No. 401,736.

Patented Apr. 23, 1889.



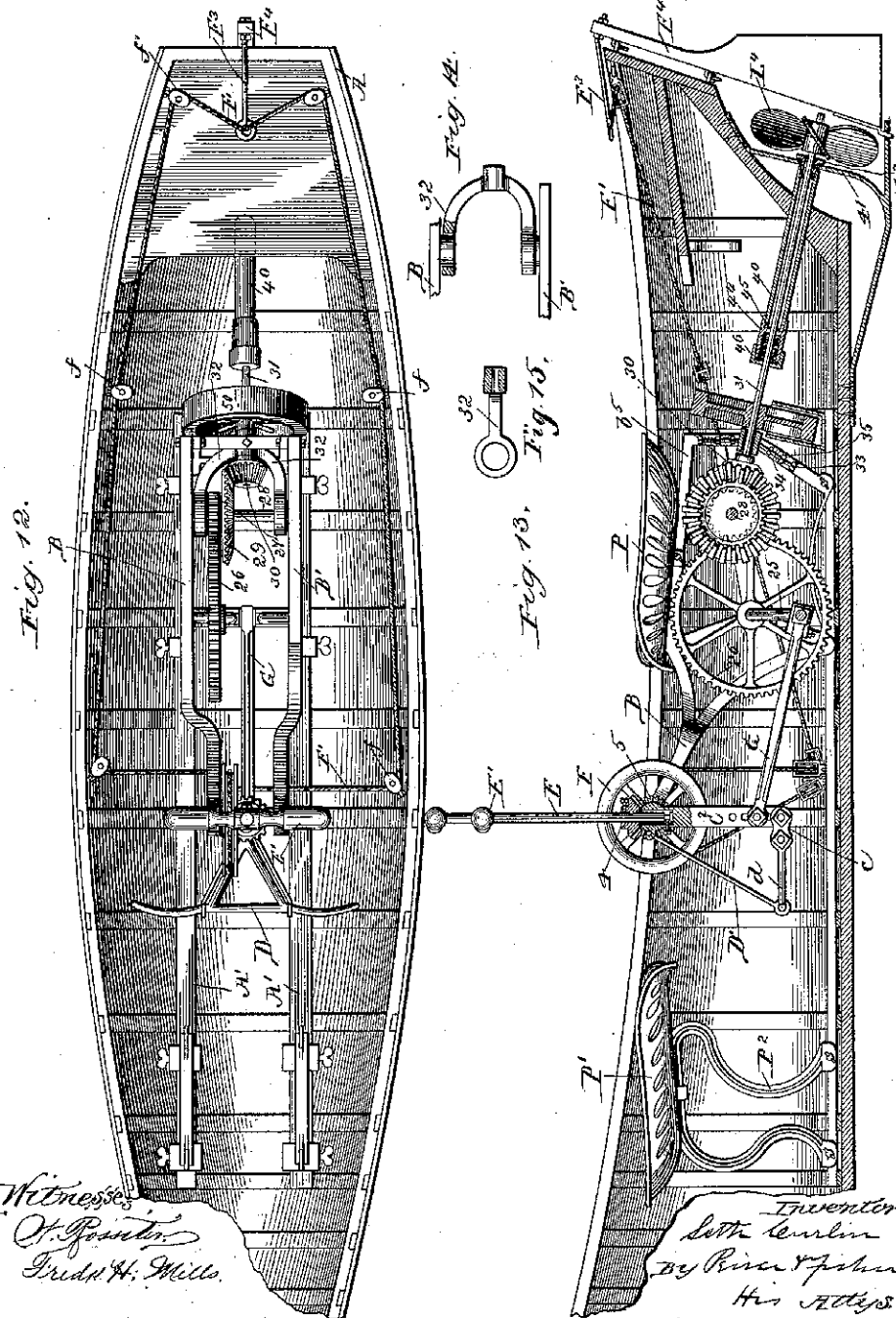
(No Model.)

4 Sheets—Sheet 4.

S. CURLIN.  
MARINE VELOCIPEDE.

No. 401,736.

Patented Apr. 23, 1889.



# UNITED STATES PATENT OFFICE.

SETH CURLIN, OF UNION CITY, TENNESSEE, ASSIGNOR TO THE SETH CURLIN MARINE VELOCIPEDE COMPANY, OF SAME PLACE.

## MARINE VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 401,736, dated April 23, 1889.

Application filed April 9, 1888. Serial No. 270,023. (No model.)

### *To all whom it may concern:*

Be it known that I, SETH CURLIN, a citizen of the United States, residing at Union City, in the county of Obion, State of Tennessee, have invented certain new and useful Improvements in Marine Velocipedes, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In Letters Patent No. 315,743, granted to me April 14, 1885, is set forth certain improved mechanism for propelling pleasure-skiffs or similar boats by means of paddle-wheels or a propeller-wheel operated by hand and foot power within the boat.

My present invention has for its object to improve and simplify the construction of mechanism set out in said patent; and to this end it consists in the various novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification. I wish it distinctly understood, however, that while, for convenience of description, my invention may be designated as a "marine velocipede," features of the invention are applicable also to the improvement of mechanism whereby the propulsion of the boat is effected simply through hand-power, and I do not therefore wish the invention to be understood as restricted to mechanism in which foot-power is necessarily employed.

Figure 1 is a view in vertical longitudinal section through the hull of the boat, the main frame and operating mechanism being shown in side elevation. Fig. 2 is an enlarged detail view in vertical transverse section through the driving-lever and connected parts, certain parts being shown in elevation. Fig. 3 is an enlarged detail side view of one of the journal-blocks and bearing-brackets of the paddle-wheels. Fig. 4 is an enlarged detail plan view of the treadle-bar and its connected parts. Fig. 5 is an enlarged detail front view of the supplemental hand-rod, the link of this rod being shown in section, and the upper portion of this rod being broken away. Fig. 6 is an enlarged detail plan view of the

link upon the supplemental hand-rod. Fig. 7 is a plan view of a side-wheel boat having my invention applied thereto. Fig. 8 is an enlarged view in transverse section through the main frame and fly-wheel, Fig. 7, parts being shown in side elevation and the paddle-wheels being omitted. Fig. 9 is a view in transverse section through the stringers just behind the sustaining-frame, parts being shown in elevation. Fig. 10 is a plan view of a boat having my invention applied thereto in connection with a stern paddle-wheel. Fig. 11 is a view in side elevation (parts being broken away) of the construction illustrated in Fig. 10. Fig. 12 is a plan view of a boat embodying certain features of my invention as applied to the driving of a stern propeller-wheel. Fig. 13 is a view in vertical longitudinal section through the hull of the boat illustrated in Fig. 12, certain parts of the mechanism being shown in vertical section. Fig. 14 is an enlarged detail plan view of the yoke at the inner end of the propeller-shaft. Fig. 15 is a detail side view of the yoke shown in Fig. 14.

A designates the hull of the skiff or other boat, upon the inner face of the bottom of which are fastened suitable rails or stringers, A', whereon are sustained the operators' seats and the mechanism by which the movement of the paddle-wheels is effected. Upon these rails A' is mounted the main frame, the sides B and B' of which are connected by tie-rods b and cross-bars b', the bottom of the frame B being adjustably held upon the rails A' by means of the set-screws b<sup>2</sup>, which serve to determine the position of the frame upon the rails.

Within the sides B and B' of the main frame, near the upper end thereof, and which sides in the drawings, Fig. 1, are made approximately in the shape of a goose body, neck, and head, are journaled the trunnions C and C', that project from the upper end of the driving-lever C<sup>2</sup>, to the lower end of which lever is bolted the yoke c, the opposite end of this yoke being formed in piece with the rods d, the outer ends of which rods are united to a treadle, D. From this treadle D extend the suspension-rods D', that are sustained by

the tie-rod  $b^3$ , that extends through the forward ends of the sides B and B' of the main frame.

To the upper end of the driving-lever C<sup>2</sup> will be connected the hand-rod E, which serves both as a means of enabling the operator to use his hands in propelling the boat and also as a convenient device for controlling the steering apparatus. This hand-rod E, which is provided at its top with the operating-handle E', adjustably bolted on the rod, is preferably connected with the operating-lever in the following manner—that is to say, the operating-lever is provided at its top with a seat or recess to receive the lower end of the hand-rod E, this hand-rod being formed with an annular groove,  $e$ , near its end, wherein will set the end of the pin 3, which serves to prevent the accidental withdrawal of the hand-rod from its seat.

Upon the hand-rod E is keyed the bevel gear-wheel 4, that engages with a corresponding bevel gear-wheel, 5, formed upon the hub of the steering-wheel F, this wheel being journaled, by preference, upon the trunnion or rock-shaft C' of the driving-lever C<sup>2</sup>. Over this steering-wheel F passes the rudder-rope F', that runs through suitable pulley-blocks,  $f$  and  $f'$ , at the bottom, sides, and stern of the boat, and connects with the bar F<sup>3</sup> of the rudder-

sition of the blocks being determined by means of the set-screws 9, that pass through threaded holes in these blocks. My purpose in thus sustaining the paddle-wheels within adjustable bearings or blocks is to enable these wheels to be raised or lowered to accommodate the mechanism to boats of different sizes and according as the boat is loaded or light.

Within the boss or arbor  $b^4$ , formed upon the side B of the main frame, is journaled the upper end of the vertical shaft O, upon which is keyed the fly-wheel O', the lower end of this shaft being preferably provided with an enlarged conical head,  $o$ , that is sustained within a suitable step or block,  $o'$ , that rests upon the casting  $o^2$ , the ends or cross-bars  $b^7$  of which are bolted, as at  $b^8$ , to the sides B and B' of the main frame. Upon the hub of this fly-wheel O' is keyed the bevel gear-wheel O<sup>2</sup>, that engages with the bevel-gear  $h$  of the shaft-wheel  $h'$ , keyed to the inner end of the section II of the main drive-shaft. At the top of the sides B and B' of the main frame are formed the rails  $b^5$ , on which is mounted the operator's seat P, from the under side of which project the lugs  $p$ , that hold the seat in position upon the top edges, and by means of the set-screws  $p'$ , that pass through threaded holes in the lugs  $p$ , the seat can be readily adjusted to bring the operator into the desired

rather than to interfere with the steadiness of the boat.

In Fig. 1 of the drawings the hand-rod E is shown as provided with a supplemental handle, E<sup>2</sup>, the purpose of which is to enable a second operator, who may occupy the seat P', to assist in working the hand-rod E, and thus aid in propelling the boat. The supplemental seat P' is mounted upon the frame P<sup>2</sup>, the bottom of which is adjustably connected with the stringers A' by means of set-screws p<sup>2</sup> and feet p<sup>3</sup>, and the seat P' is held upon the frame P<sup>2</sup> by means of the flanges p<sup>4</sup> and set-screws p<sup>5</sup>, which enable the position of the seat to be adjusted either backward or forward, or enable it to be reversed. It is apparent that if the operator occupying the seat P' is to assist in working the hand-rod E the seat P' will be turned to a position the reverse of that shown in the drawings, Figs. 1 and 2. If desired, however, the operator occupying this supplemental seat may operate a separate hand-rod, R, the lower end of which is stepped in the forked casting r, that enters holes in and is pivotally connected to the cuffs or blocks c, that are adjustably attached by set-screws r'.

The upper end of this rod R is provided with one or more handles, E<sup>1</sup>, and this rod R passes through the link or casting r<sup>2</sup> to the yoke-shaped ends of which is attached by a suitable bolt the drive-rod R', that is connected with the yoke c at the bottom of the main drive-lever C<sup>2</sup> by means of the bolt 2. The link or casting r<sup>2</sup> is held on the supplemental hand-rod R by a set-screw, r<sup>3</sup>, and, if desired, a further supplemental drive-rod, R<sup>2</sup>, may lead from the hand-rod R to another supplemental hand-rod for another operator near the bow of the boat. It will thus be readily seen that any desired number of operators may assist in the propulsion of the boat, although for ordinary pleasure-boats one or two will usually be sufficient.

In order to effect the steering of the boat, it is only necessary for the operator to turn the handle E' and the hand-rod E, as by so doing the bevel gear-wheel 4, by reason of its engagement with the corresponding wheel, 5, will revolve the steering-wheel F and cause the rope F', which passes over this wheel, to shift the rod F<sup>2</sup> of the rudder, according as the handle E' is turned in either direction. It will thus be seen that the mechanism for steering the boat is under the constant control of the operator, and by mounting the hand-rod E so that it can be freely turned I am enabled to avoid the necessity of using a supplemental sleeve or similar device for controlling the movement of the steering-wheel. By mounting the steering-wheel F in vertical position, as shown, I am enabled to lead the steering-rope directly therefrom to the bottom of the boat, where it will be out of the way. My object in mounting the bevel gear-wheel 4 immediately above the trunnions C and C' of the driving-lever C<sup>2</sup> is to hold this

wheel, so that as the hand-rod is moved back and forth the corresponding movement of the wheel 4 will be so slight as to not affect the steering-wheel F or the rudder.

My purpose in adjustably mounting the main frame, which sustains the operating mechanism upon the stringers A', is to enable this frame and such mechanism to be moved either back or forth in order to properly balance the boat; and it is apparent that when any shift in the position is thus made it will only be necessary to correspondingly lengthen or shorten the drive-chains I, which may be of the well-known link-belt type.

My object in sustaining the journals of the paddle-wheels L in adjustable bearings M is to enable these wheels to be raised or lowered to compensate for the variations in height of the sides of the boat to which the operating mechanism may be applied, and to compensate also for the change in the draft of the boat, according as it is loaded or light. The upper faces of the brackets M' are preferably curved, as shown, and correspond with an arc drawn from the center of the main drive-shaft II II', so that when the main frame has been set within the boat, and it is simply desired to vary the position of the journals of the paddle-wheels, they can be moved up or down upon the standards without shifting the position of the main frame.

In Figs. 10 and 11 of the drawings my invention is shown as applied to a boat having a single paddle-wheel at its stern. In this construction the sides B and B' of the main frame, which support the operating mechanism, are connected by tie-rods b and cross-bars b', but are of somewhat different shape from those hereinbefore described. The precise shape, however, of the main frame I do not regard as important. In the upper ends of these sides B and B' is journaled the driving-lever C<sup>2</sup> with the adjacent and connected parts, as above described; but in this modification the main drive-shaft II is a single undivided shaft that is journaled in the boss b<sup>1</sup> upon the side B of the frame and in a brace-bar, B<sup>2</sup>, that is bolted to and extends outwardly from the side B of the frame, and upon the inner end of this drive-shaft is keyed the shaft-wheel h, similar to that above described, and in like manner engaging with the bevel-gear O<sup>2</sup> of the fly-wheel O'. On the outer end of this drive-shaft II is keyed the sprocket-wheel I, over which passes the sprocket chain or belt I', that leads to a sprocket-wheel, K, upon the end of the journal 1 of the stern paddle-wheel L, and in this construction suitable idlers, 11 and 12, held within a standard, 13, bolted to the stern of the boat, are employed to guide the sprocket chain or belt from the main drive-shaft to the shaft of the paddle-wheel. In this modified construction the steering apparatus is the same as that already described. The stern paddle-wheel L is sustained within the rearwardly-projecting beams 14 and 15, that may

be provided with a suitable hood, 16, over the top of the paddle-wheel, and the front ends of these beams are by preference connected by hinges 17 to the rear seat or cross-bar, 18, so that the outer ends of the beams can be raised or lowered in order to enable the paddle-wheel to be vertically adjusted. This vertical adjustment of the paddle-wheel is effected by means of the threaded spindles 19, the reduced lower ends of which are stepped in the brackets 20, that are affixed to the stern of the boat, and these spindles extend through the threaded bars 21, bolted to the under sides of the beams 14 and 15, and have their upper ends provided with suitable hand-wheels, 22, by which they can be readily turned. My purpose in thus adjustably mounting the beams that sustain the stern paddle-wheel is to enable this wheel to be raised or lowered to compensate for the height of the stern, either when the mechanism is applied thereto or when this may be rendered desirable by the variation of the load of the boat, and it will be readily seen that by turning the spindles 19 by means of the hand-wheels 22 the adjustment of the paddle-wheel L can be easily effected.

From the foregoing description it will be understood that the rotation of the stern-wheel L necessary to effect the propulsion of the boat will occur when the drive-lever C<sup>2</sup> is operated, the movement of this lever being communicated to the shaft-wheel h through the pitman G, and from this shaft-wheel through the main shaft H, the sprocket-wheel I, and the chain I', and sprocket-wheel K to the paddle-wheel L.

In the modification illustrated in Figs. 12 and 13 of the drawings my invention is shown as applied to the propulsion of the boat through the medium of a propeller-wheel, L<sup>4</sup>, and in this construction the drive-lever C<sup>2</sup> and its connections and the steering apparatus are the same as that already described. In this construction, however, the ends of the main drive-shaft H are journaled in the sides B and B' of the main frame, and this main drive-shaft is provided with a crank, 25, to which the end of the pitman G is connected. Upon the main drive-shaft H is keyed the shaft-wheel 26, that engages with the pinion 27, keyed upon the shaft 28, the ends of which are journaled in the sides B and B' of the main frame, the sides of the main frame in this construction being provided with bosses, through which the ends of the shaft 28 pass. Upon the shaft 28 is also keyed the bevel gear-wheel 29, that engages with a corresponding bevel gear-wheel, 30, affixed to the inner end of the propeller-shaft 31. This propeller-shaft 31 has its inner end journaled within a yoke, 32, the ends of which are sustained upon the bosses, and the position of this yoke can be shifted vertically by means of the threaded spindles 33, that pass through the bars 34 and bear upon the opposite sides of the yoke, the position of these spindles being determined

by means of suitable set-nuts, 35. The propeller-shaft 31 by preference extends through a tubular casing, 40, that passes through the stern of the boat, and has its rear end held within the bracket-plate 41, that is bolted to the stern and bottom of the boat. The rear end of the tubular sleeve 40 is provided upon its interior with a screw-thread adapted to receive the corresponding exteriorly-threaded bearing-sleeve 42, through which the propeller-shaft 31 passes, the flange of this bearing-sleeve 42 being, by preference, upon the rear side of the bracket-plate 41 and serving to hold the sleeve 40 in proper position with respect to said plate. The forward end of the tubular sleeve 40 is exteriorly threaded to engage with the corresponding threads upon the interior of a tubular stuffing-box, 44, that is provided with a perforated division-plate, 45, between which and the cap 46, that screws onto the end of the stuffing-box 44, will be held suitable packing. By thus sustaining the propeller-shaft within a tubular sleeve, 40, I am enabled to provide a very secure bearing for this shaft and to obtain an effective means for packing the bearings of the shaft and preventing all leakage of water into the boat.

My purpose in mounting the inner end of the propeller-shaft 31 within the adjustable yoke 32 is to enable the shaft and propeller-wheel to be properly set in position upon any boat notwithstanding the variations in the size or draft thereof, and it will be readily seen that if it is desired to change the angle of the propeller-shaft in order to accommodate it for a boat of greater or less draft, this can be readily accomplished by varying the position of the yoke through the medium of the adjusting-bolts, it being understood, however, that a corresponding change in the opening through the stern of the boat will be made.

From the foregoing description it will be seen that when motion is imparted to the driving-lever C<sup>2</sup> by the operator in the manner hereinbefore described the shaft-wheel 26, through the medium of the cog-wheel 27, shaft 28, and bevel-gears 29 and 30, will cause the rotation of the propeller-shaft and wheel necessary to effect the propulsion of the boat. Upon the propeller-shaft 31 is mounted a fly-wheel, 50, corresponding with the fly-wheel O', in the construction hereinbefore described, and serving the same purpose.

I wish it distinctly understood that features of the invention may be employed without the adoption of the invention as an entirety. Thus, for example, the steering apparatus may be used in connection with other forms of propelling mechanism, and so also the driving-lever and its connections may be operated simply by hand-power or foot-power, although I prefer the employment of both.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a marine velocipede or similar apparatus, the combination, with suitable mechanism for imparting movement to the propeller or paddle wheels and suitable steering mechanism, of a single main hand-rod consisting of a single bar pivotally sustained with respect to the mechanism for propelling the boat and connected directly with the steering mechanism, whereby said single hand-rod serves to effect both the movement of the driving mechanism and of the steering mechanism, substantially as described.

2. In a marine velocipede or similar apparatus, the combination, with a driving-lever for imparting movement through suitable intermediate mechanism to the propeller or paddle wheels, said driving-lever having a socket in its upper end, of a main hand-rod having its lower end fitted within the socket of the driving-lever, and suitable steering mechanism connected with said hand-rod, whereby said hand-rod serves to effect both the movement of the driving-lever and of the steering mechanism, substantially as described.

3. In a marine velocipede or similar apparatus, the combination, with the driving-lever C<sup>2</sup>, of a hand-rod, E, mounted upon the end of said driving-lever in a manner free to turn, a steering-wheel, F, gear-wheels 4 and 5, and suitable connections from said gear-wheel to the rudder, substantially as described.

4. In a marine velocipede or similar apparatus, the combination, with the driving-lever C<sup>2</sup>, of a suitable hand-rod, E, mounted in a manner free to turn, a steering-wheel, F, journaled upon the trunnion or shaft of said driving-lever, suitable gear-wheels connecting said hand-rod with the steering-wheel, and suitable ropes leading from said steering-wheel to the rudder, substantially as described.

5. In a marine velocipede or similar apparatus, the combination, with the driving-lever C<sup>2</sup>, of a hand-rod for moving said driving-lever, said hand-rod being mounted in a manner free to turn, a steering-wheel provided

with a bevel-gear, and a bevel-gear upon the hand-rod, and suitable connections leading from said steering-wheel to the rudder, substantially as described.

6. In a marine velocipede or similar apparatus, the combination, with the hull, of suitable stringers or supports, A', attached thereto, the operating mechanism, and a main frame for sustaining said operating mechanism, said main frame being movably mounted upon said stringers and within said hull, and suitable means for adjusting said main frame in the direction of the length of the hull, substantially as described.

7. In a marine velocipede or similar apparatus, the combination, with the sides B and B', of the main frame for supporting the driving-lever and operating mechanism, said main frame having rails B<sup>2</sup>, extending lengthwise of the boat, of the operator's seat P, adjustably mounted upon said rails, whereby said seat can be moved in the direction of the length of the boat, substantially as described.

8. In a marine velocipede or similar apparatus, the combination, with the paddle-wheels, of the brackets M', having the curved bearing portions, and the vertically-movable journal-blocks M for the shafts of said wheels, said journal-blocks being adjustably mounted upon the curved portions of said brackets, substantially as described.

9. In a marine velocipede or similar apparatus, the combination, with the main frame, of a driving-lever, C<sup>2</sup>, sustained within said main frame, a suitable hand-rod and treadle connected with said driving-lever, a main shaft and shaft-wheel sustained within said main frame that supports the driving-lever, a pitman for imparting motion to said main shaft from the driving-lever, and suitable mechanism leading from said shaft-wheel to the paddle-wheels or propeller-wheel, substantially as described.

SETH CURLIN.

Witnesses:

GEO. T. FISHER, Jr.,  
I. B. CARPENTER.



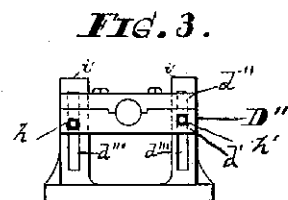
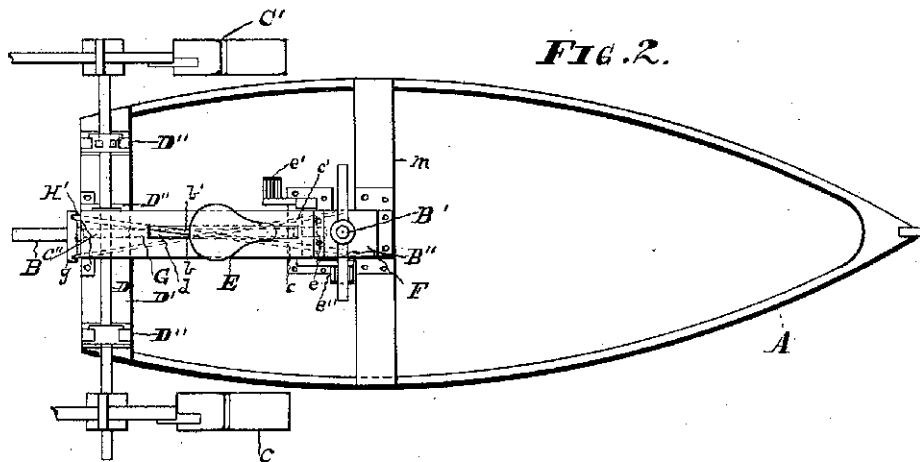
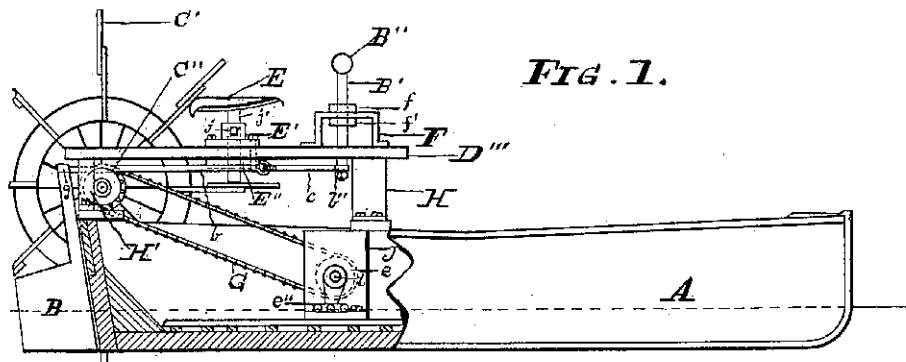


(No Model.)

G. RIEXINGER.  
BOAT PROPELLING MECHANISM.

No. 424,026.

Patented Mar. 25, 1890.



Witnesses:

*Ch. Stark*  
*Michael J. Stark*

Inventor:

*Geo. Riesinger*  
*by Michael J. and Wm. Stark*  
Attorneys.

# UNITED STATES PATENT OFFICE.

GEORGE RIEXINGER, OF BUFFALO, NEW YORK.

## BOAT-PROPELLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 424,026, dated March 25, 1890.

Application filed October 21, 1889. Serial No. 327,713. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE RIEXINGER, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful  
5 Improvements on Boat-Propelling Mechanism; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification,  
10 which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to improvements in propelling mechanism for skiffs  
15 and other boats; and it consists, essentially, in the novel and peculiar combination of parts and details of construction, as hereinafter first fully set forth and described, and then pointed out in the claims.

20 In the drawings already mentioned, which serve to illustrate my said invention more

belt G, which connects with a similar sprocket-wheel *e*, fastened to a shaft *i*, which is journaled in a U-shaped frame J, as clearly shown  
55 in Fig. 1 of the drawings. On the extremities of this shaft *i* are located pedals *e' e''*, by means of which said shaft, and through it the wheel-shaft and paddles, are revolved in an obvious manner. The U-shaped frame J is  
60 bolted to the floor or foot-board and keel of the boat in any suitable manner.

D''' designates the backbone, supported at the stern by a U-shaped standard H', fastened to the bottom board D', and at the forward  
65 end by a similar standard H, secured to a cross-board *m*. This backbone is provided with a longitudinal slot *d* for the reception of the lower end of a seat-bracket E, as hereinafter described. At the forward end of this  
70 backbone is placed a U-shaped bracket F to support a spindle B' of the steering-gear, said spindle being provided with two collars *f f'*,

gear parallel, as shown in Fig. 1, instead of crossed, without changing the nature of my invention.

Having thus fully described my invention, I claim as new and desire to secure to me by Letters Patent of the United States—

1. In hand-propellers, the combination, with the backbone  $D'''$ , having the longitudinal slot  $d$ , of the seat  $E$ , having the shank  $j'$ , journaled in the seat-bracket  $E'$ , having the set-screw  $j$ , and the plate  $E''$  underneath the backbone, substantially as described.

2. In a boat-propelling mechanism, the combination, with the backbone supported at its forward and after ends, as described, of the seat-bracket sliding on said backbone, the seat vertically adjustable in said bracket, the U-shaped frame fastened in the bottom of the boat, a shaft journaled within said frame and having centrally a sprocket-wheel within the parallel sides thereof and on the extremities outside of the frame cranks and pedals, bearings fastened to a cross-board on the boat, a paddle-shaft having paddles at both ends journaled in said bearings, a sprocket-wheel on said shaft, and a link belt connecting said sprocket-wheels, as described.

3. The combination, with the backbone having the seat, as described, and secured to cross-boards fastened to the boat, of an inverted-U-shaped frame secured to the forward end thereof, a vertical spindle having a handle at

its upper end and with collars above and below the horizontal portion of said frame and journaled in said frame and backbone, a cross-bar secured to the lower end of said spindle, a rudder having a cross-bar, and jointed rods connecting said cross-bars and crossing each other, substantially as described.

4. The combination of the backbone provided with the seat and fastened by means of supports to cross-boards on the boat, a frame having a shaft and a sprocket-wheel on said shaft between the parallel sides thereof, said frame being fastened in the bottom of the boat, a series of vertically-adjustable bearings consisting of a base having slotted uprights, half-bearings secured together by bolts and sliding between said uprights, one of said half-bearings provided with apertures opposite said slots, bolts passing through said slots and apertures and having nuts, as described, paddle-shaft having paddle-wheels at both ends journaled in said bearings, a sprocket-wheel on said shaft, and a link belt connecting said sprocket-wheels, as described.

In testimony that I claim the foregoing as my invention I have hereto set my hand in the presence of two subscribing witnesses.

GEORGE RIEXINGER.

Attest:

WM. O. STARK,

THOMAS RIEXINGER, Jr.

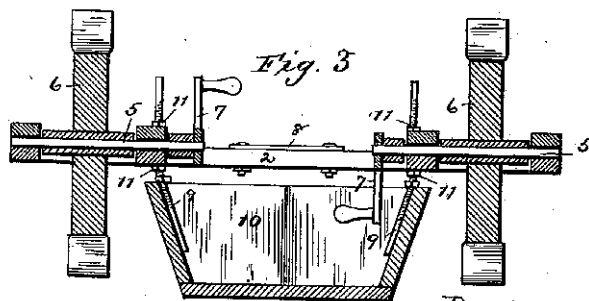
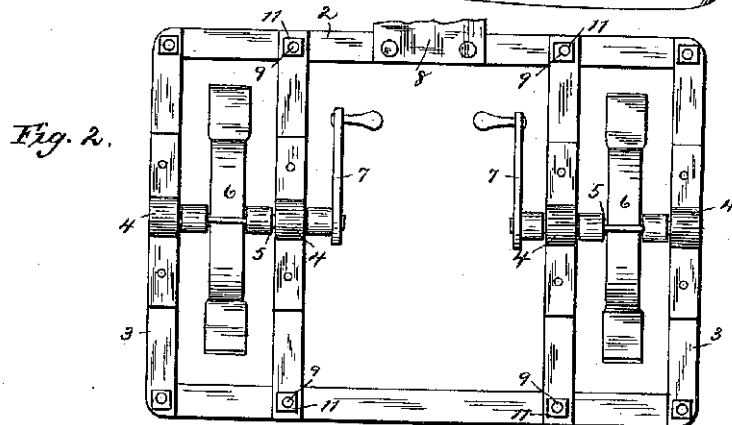
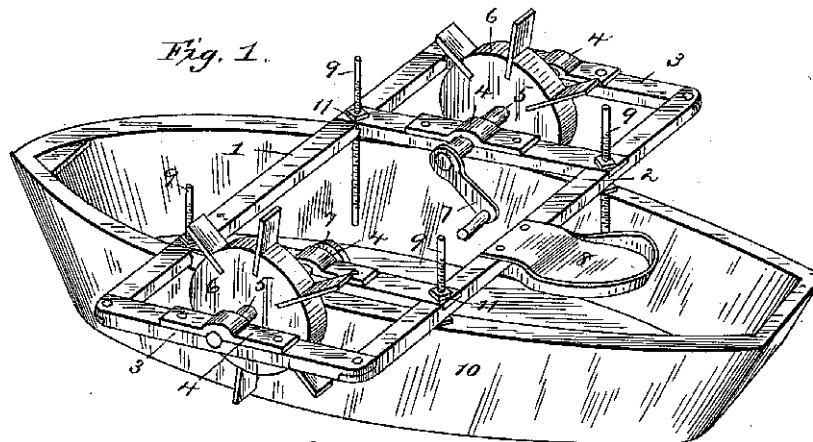


(No Model.)

B. JARRELL.  
BOAT.

No. 428,213.

Patented May 20, 1890.



Witnesses:

H. L. Atner.

*H. L. Atner*

By his Attorneys,

Inventor

Benjamin Jarrell.

*C. A. Snow & Co.*

# UNITED STATES PATENT OFFICE.

BENJAMIN JARRELL, OF LEE'S CREEK, OHIO.

## BOAT.

SPECIFICATION forming part of Letters Patent No. 428,213, dated May 20, 1890.

Application filed March 20, 1890. Serial No. 344,811. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN JARRELL, a citizen of the United States, residing at Lee's Creek, in the county of Clinton and State of Ohio, have invented a new and useful Boat, of which the following is a specification.

This invention has relation to hand-propellers for boats; and among the objects in view are to provide a propeller adapted to be operated by hand and to be mounted in a suitable frame-work, which frame is adjustably mounted on the boat elements.

With the above objects in view the invention consists in a rectangular frame adjustably applied to the gunwales of a boat, means for securing the same in position, and opposite paddle-wheels mounted upon independent crank-shafts provided with cranks adapted to be operated by hand.

Referring to the drawings, Figure 1 is a perspective of a boat provided with attachment constructed in accordance with my invention. Fig. 2 is a plan of the attachment. Fig. 3 is a transverse central section of the attachment in position.

Like numerals of reference indicate like parts in all the figures of the drawings.

The attachment comprises a rectangular frame-work consisting of front and rear side bars 1 and 2 of a length greater than the width of an ordinary skiff or row boat, so that the ends of said bars will project considerably beyond the gunwales of the boat, and opposite pairs of side bars 3, a pair being arranged at each side of the gunwales.

The side bars 3 form an intermediate space at each side of the boat, and each pair of side bars is provided with opposite bearings 4, and in each pair of bearings there is mounted a transverse shaft 5, said shaft being perfectly independent of each other. Paddle-wheels 6, of any ordinary construction, are mounted upon each of the shafts and rotate with the shafts, which latter are provided with operating-cranks 7, located at the inner ends of the shafts.

A seat 8 is secured to the rear end bar 2, so that the operator is in a position to readily grasp and operate the cranks, either singly

or in unison and in the same or opposite directions, as desired. By operating the cranks from front to rear the vessel will be propelled forward, and by reversing the cranks a backward motion will be given. By operating one crank in one direction and the other crank in the opposite direction the vessel will be sharply turned, as will be readily understood.

In Fig. 1 I have shown my invention applied to a skiff 10 of ordinary construction, the attachment being adjustably connected therewith. From two opposite points of the gunwales there project upward threaded bolts 9, which project through openings formed in the inner side bars 3. These bolts are provided above and below the bars with nuts 11, by which the frame may be raised and lowered, so that the paddle-wheels will not enter too deep in the water when the boat settles by reason of its cargo.

The manner of raising and lowering the frame so that more or less of the paddle-blades will enter the water will be readily understood, in that it is simply necessary, for instance, to elevate the frame, as when the boat is loaded, to loosen the upper nut upon each rod, then screw up the lower set of nuts until the frame is sufficiently elevated, and then tighten the upper nuts upon the frame, so that the same is tightly clamped in position between the two sets of nuts.

Having thus described my invention, I claim—

1. The herein-described attachment for boats, the same consisting of a frame having opposite end bars, opposite connecting pairs of side bars, bearings formed in each pair of side bars, shafts mounted in the bearings and independent of each other, paddle-wheels mounted on the shafts, and cranks arranged upon the ends of the shafts, substantially as specified.

2. The herein-described attachment for boats, the same consisting of a frame having opposite end bars, opposite connecting pairs of side bars, bearings formed in each pair of side bars, shafts mounted in the bearings and independent of each other, paddle-wheels mounted on the shafts, and cranks arranged

upon the ends of the shafts, in combination with a boat, the adjusting-bolts projecting from the same and passing through the frame, and the opposite set-nuts mounted on the bolts and arranged at each side of the frame, substantially as specified.

In testimony that I claim the foregoing as

my own I have hereto affixed my signature in presence of two witnesses.

BENJAMIN JARRELL.

Witnesses:

JOHN WEST,  
JOHN KIRBY.

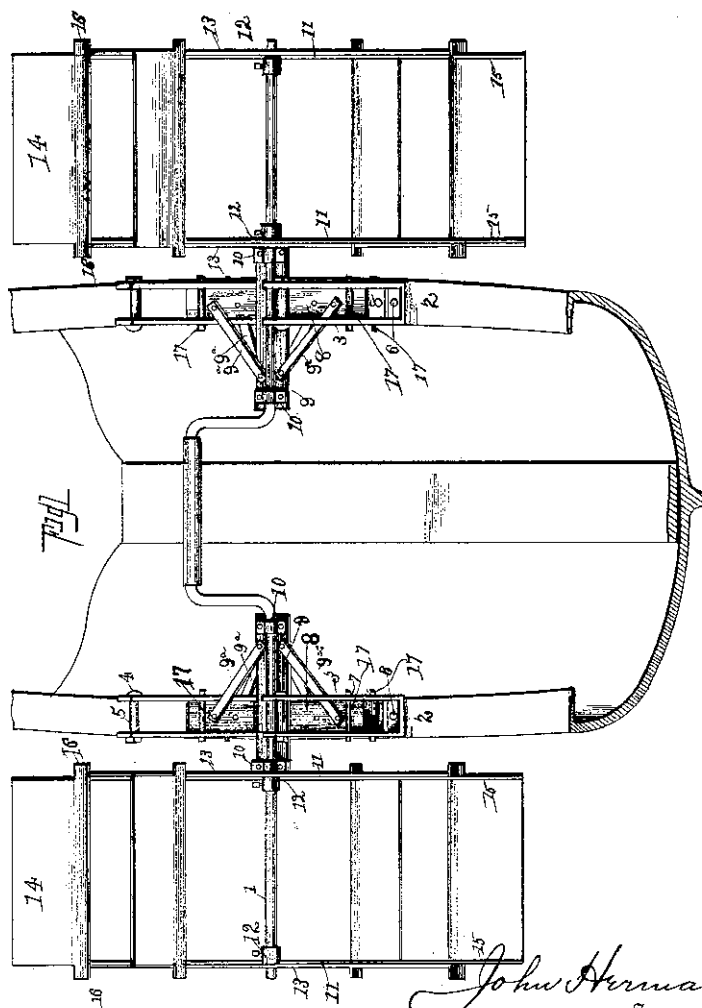
(No Model.)

2 Sheets—Sheet 1.

J. HERMANS.  
BOAT PROPELLER.

No. 435,583.

Patented Sept. 2, 1890.



John Hermans  
Inventor

Witnesses  
T. W. Moughby  
J. A. King

By W. T. Fitzgerald  
Attorney



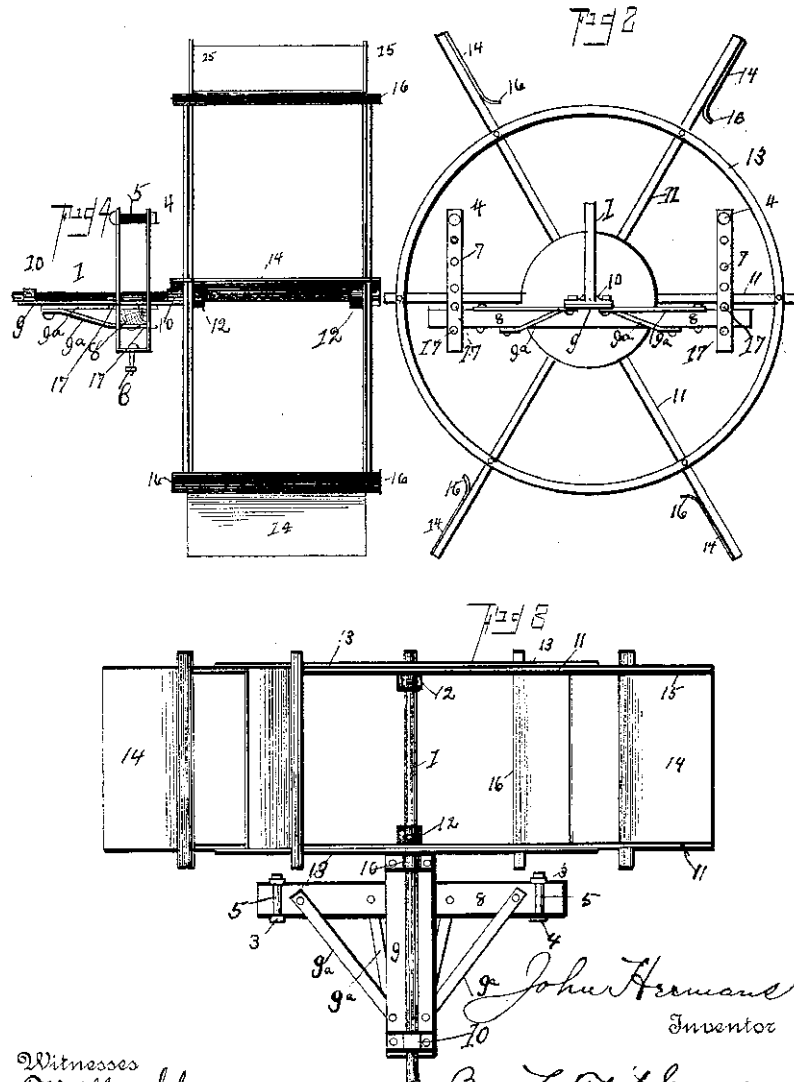
(No Model.)

2 Sheets—Sheet 2.

J. HERMANS.  
BOAT PROPELLER.

No. 435,583.

Patented Sept. 2, 1890.



Witnesses  
T. Willoughby  
Andrew J. Schwartz

John Hermans  
Inventor  
By W. D. Fitzgerald  
Attorney

# UNITED STATES PATENT OFFICE.

JOHN HERMANS, OF CHICAGO, ILLINOIS.

## BOAT-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 435,583, dated September 2, 1890.

Application filed May 20, 1890. Serial No. 352,434. (No model.)

### *To all whom it may concern:*

Be it known that I, JOHN HERMANS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Boat-Propellers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in a new and improved apparatus or attachment for row-boats which can be secured in position in a few moments to any row-boat, and in which the paddle-wheels can be easily raised and lowered to suit the depth of water; and my invention will be hereinafter fully described and claimed.

Referring to the accompanying drawings, Figure 1 is a perspective rear view of my new and improved propelling apparatus. Fig. 2 is a side view taken from the inner side of one of the paddle-wheels. Fig. 3 is a top plan view of the parts shown in Fig. 2, and Fig. 4 is a rear elevation of one of the paddle-wheels and its adjacent parts.

The same numerals of reference indicate corresponding parts in all the figures.

Referring to these several parts by their designating-numerals, 1 indicates the main crank-shaft of my propelling apparatus, which may be arranged to be worked either by foot or by hand power.

In securing my device in position I secure at each side of a boat upon the gunwale thereof two parallel rectangular frames or brackets 3, which are preferably formed each of a single flat metal piece bent as shown and having its upper ends connected by a threaded bolt 4, passing through a sleeve 5, and having a nut screwed upon its end. These frames 3 are secured upon the gunwale of a boat by bolts 6. The vertical parallel sides of each frame 3 are formed with the series of opposite holes 7. Through each pair of frames 3 pass the ends of a supporting-bar 8, as shown, this bar being preferably formed of wood. Upon each bar 8 is bolted a bearing-plate 9, this plate crossing the bar at right angles and having upon each of its ends a bearing 10. The bearing-plates extend inward, as shown, and are firmly held by the upper and lower braces 9<sup>a</sup> 9<sup>b</sup>, having their outer ends bolted to the bearing-plates and the inner ends bolted to the bars 8. The drive-shaft 1 is mounted,

supported, and turns in these bearings 10 on the bearing-plate, and upon its ends are secured the paddle-wheels. The ends of the supporting-bars 8 are adjustably supported in the frames 3 between transverse bolts 17, which pass through the openings 7 in the sides of the frames, and it will be seen that the paddle-wheels, together with the entire drive-shaft and supporting-bars and the bearing-plates 9 9, can be readily raised and lowered to suit shallow water and different depths of water by removing the supporting-bolts 17, raising or lowering the cross-bars or supporting-bars 8, as desired, and reinserting the bolts through the appropriate holes 7.

From the foregoing description, taken in connection with the accompanying drawings, the construction, operation, and advantages of my new and improved propelling apparatus will be readily understood. It will be seen that my propelling apparatus is simple, light, and strong in construction, it is very efficient in operation and will propel a boat rapidly, and the entire apparatus can be easily and readily raised and lowered to suit different depths of water and to raise the wheels when the boat is going through shallow water where the bottom is covered with weeds and grass.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the frames 3, formed with the parallel side pieces provided with the series of side apertures 7, the transverse removable bolts 17, the adjustable supporting-bars 8, the ends of which fit, movably, between the parallel side piece of the frames 3, and a crank-shaft mounted on the said bars and having end paddle-wheels, substantially as set forth.

2. The combination of the frames 3, formed with the series of side apertures 7, the transverse removable bolts 17, the adjustable supporting-bars 8, the bearing-plates 9, secured upon the bars and having the end bearings 10, the braces 9<sup>a</sup>, and the drive-shaft mounted in the end bearings 10 and having paddle-wheels at its ends, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN HERMANS.

Witnesses:

JAMES HIGGINS,  
THOMAS BOLAND.

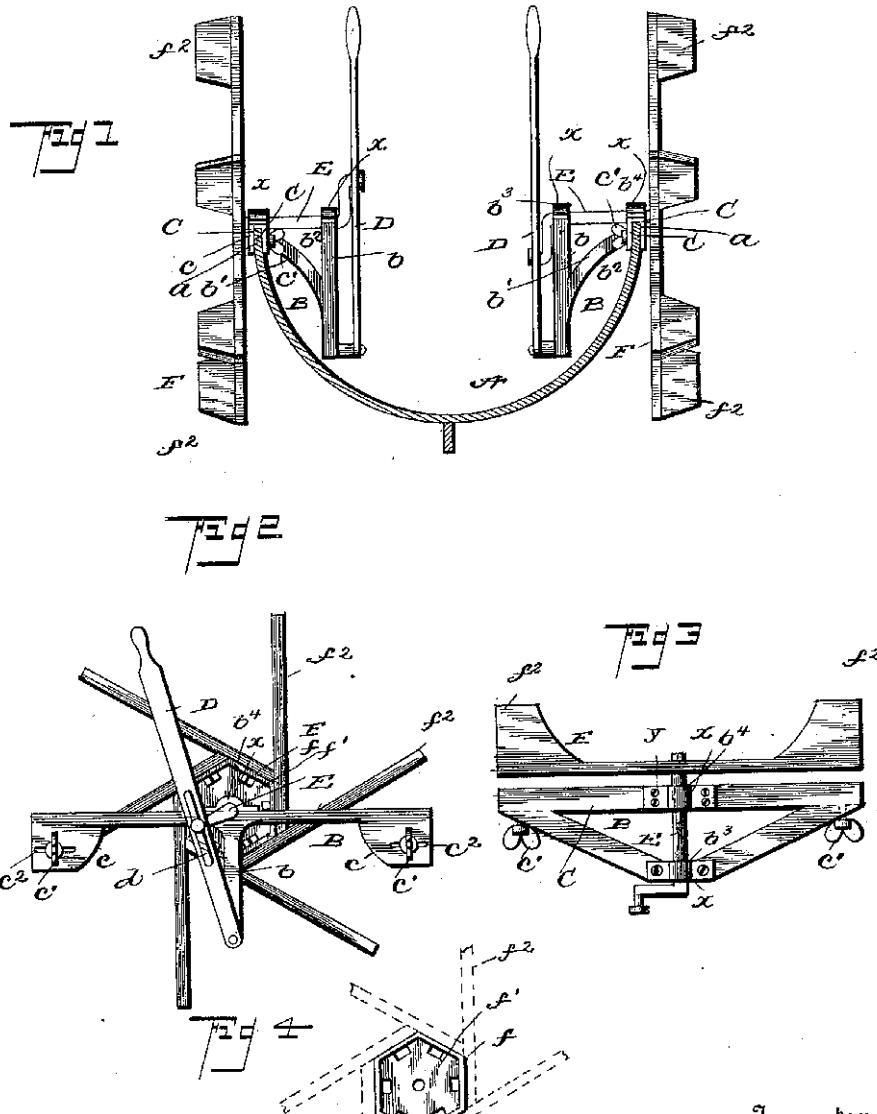


(No Model.)

A. M. HASWELL.  
MEANS FOR PROPELLING BOATS.

No. 481,113.

Patented Aug. 16, 1892.



Witnesses

*Wm. J. Davis*  
*Wm. J. Davis*

Inventor

*Alanson M. Haswell.*

By his Attorney

*L. Deane*

# UNITED STATES PATENT OFFICE.

ALANSON M. HASWELL, OF SPRINGFIELD, MISSOURI, ASSIGNOR OF ONE-HALF TO JOSEPH C. PLUMB, OF SAME PLACE.

## MEANS FOR PROPELLING BOATS.

SPECIFICATION forming part of Letters Patent No. 481,113, dated August 16, 1892.

Application filed February 13, 1892. Serial No. 421,308. (No model.)

*To all whom it may concern:*

Be it known that I, ALANSON M. HASWELL, a citizen of the United States, residing at Springfield, in the county of Greene and State of Missouri, have invented certain new and useful Improvements in Means for Propelling Boats, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Figure 1 is a view, partly in section and partly in elevation, of a boat having this device applied as in use. Fig. 2 is a side elevation of one of the paddle-wheels and its connections detached from the boat. Fig. 3 is a top plan view of the same. Fig. 4 is a detail in side elevation of the hub.

This invention relates to improvements in mechanism for propelling boats by means of hand-power; and the novelty consists in the details of the structure and the combination as a whole and in combining the entirety with a boat, all as will now be more fully described, as well as pointed out in the claims, reference being had to the accompanying drawings, in which—

A denotes any ordinary boat, and, as now shown, is an open boat; but the detail of structure in this respect is not at all material to the present invention because it is equally applicable to an open boat, or one partly decked or covered in, or one fully decked.

The operative or propelling mechanism consists of the frame B, which, as now shown, is made of the vertical part *b*, the inclined part *b'*, and having angled parts *b''*, the former extending from the lower end of *b* to the center of the gunwale-strip C, and the latter from its upper end converging on each side, respectively, to ends of said strip C. Each of the outer ends *c* of the gunwale-strip C is bent, at a right angle, so as to form a clamping-strap, which is of proper shape and size to fit on the gunwale *a* of any ordinary boat. It is here secured by means of the thumb-screw *c'* operating from the inside of the boat through the slot *c''* in the strap.

To the lower end of the vertical part *b* is pivoted the handle-lever D at its lower end. This lever has a slot *d* about mid-length, in

which slot the inner end of the crank-shaft E plays. This crank is journaled in bearings *b''* in the top of vertical part *b* and in the gunwale-strip at *b'*, the place where the upper end of the inclined piece *b'* connects with it. Suitable removable caps *x* at the top of *b* and *y* at the top of *b'* serve to hold the shaft in these bearings. On the outer end of this crank-shaft is secured in any suitable way the paddle-wheels F, whose blades *f'* are provided at their outer ends with lateral wings or extensions *f''*, as clearly shown in Figs. 1 and 3, standing outward from said blades. The shanks of the blades *f'* of this wheel are fixed by nuts and bolts to the exterior of this hub *f*, which is hexagonal or any convenient shape to accommodate the desired number of blades. The faces of this exterior are such that the blades will be properly extended for use. There are suitable notches or openings in the hub for permitting the application of the securing-nuts on the ends of the bolts which hold the blades.

The above description applies to the frame and wheel as adapted to one side of the boat. The opposite side is equipped in like manner.

It will be noticed that this apparatus can be readily applied to any part of the boat—that is, midships or forward or aft. This is a point of large value, because the propelling-piece can be applied as is rendered necessary by the number of passengers. For instance, when but a single person is on the boat, he may put the wheels where he pleases, or when a crowd is on the boat the wheels can be adapted to suit their convenience. The occupant of the boat or the one who propels it, being seated so as to grasp in each hand one of the lever-handles, can operate the paddle-wheel simultaneously, so as to produce a direct forward movement of the boat, or can operate them at the same time in reverse direction, as in turning the boat, or can operate one at a time.

It will be noted that the peculiar way in which the operating-lever is secured admits not only of great strength, but allows the use of a very long lever without disfiguring the appearance of the apparatus or at all interfering with the operation of the operator or the occupant of the boat.

It is preferred to make the frame entirely of metal; but this of course is a matter of expense. I design to make this frame in any way that will make its cost low and secure  
5 lightness and strength.

If desired, a spring or any other clamp can be used instead of the strap *c* and set-screw. Its ease of adaptability to any ordinary boat and its solidity when secured to the boat recom-  
10 mend it very strongly. When desired for use, the wheel and its frame are detached from the boat and so can be put under cover, as well as remove temptation for using the boat by strangers or others not entitled to its  
15 use, and, as above remarked, it enables the position of the wheels to be arranged to suit the convenience of the occupants of the boat.

Having described my invention, I claim—

1. In a boat-propelling apparatus, the combination, with the paddle-shaft and means for  
20 operating it, of the frame *B*, consisting of the vertical part *b*, the inclined part *b'*, and angle parts *b<sup>2</sup>*, connected to and combined with the gunwale-strip *C*, having means for horizontally adjusting it upon the boat, substantially  
25 as set forth.

2. In combination with the frame *B*, made as described, and the gunwale-strip *C*, bearing said frame, the lever *D*, pivoted to part *b*  
30 of the frame and slotted at *d*, the crank-arm *E*, passed through the slot *d'*, and paddle-wheel connected to said arm, substantially as and for the purpose set forth.

3. The frame *B*, bearing the gunwale-strip  
35 *C* and having oppositely-inclined portions se-

cured to the ends of said gunwale-strip at their divergent ends, and the aligned bearings or boxes, one secured upon said strip and the other secured to the converging ends of said  
40 inclined portions, in combination with the crank-shaft *E*, bearing the paddle-wheel, and means for operating said shaft, said frame with the shaft and wheel all being horizontally adjustable upon the boat, substantially  
45 as and for the purpose set forth.

4. The combination of the gunwale-strip having means for its horizontal adjustment upon the vessel and the frame carried by  
50 said gunwale-strip and adapted to bear the paddle-wheel shaft and comprising a central pendent bar having an outward and upward inclined bar or arm connected to said gun-  
wale-strip, substantially as set forth.

5. The gunwale-strip having pendent screw-clamps for adjustably connecting it to the ves-  
55 sel, and the frame having its inclined portions connecting with said gunwale-strip, and a central pendent bar at the converging ends of said inclined portions, provided with an upward and outward inclined bar or arm con-  
60 necting with said gunwale, in combination with the paddle-wheel shaft and means for operating said shaft, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALANSON M. HASWELL.

Witnesses:

L. E. ALEXANDER,  
M. J. SEEMANN.



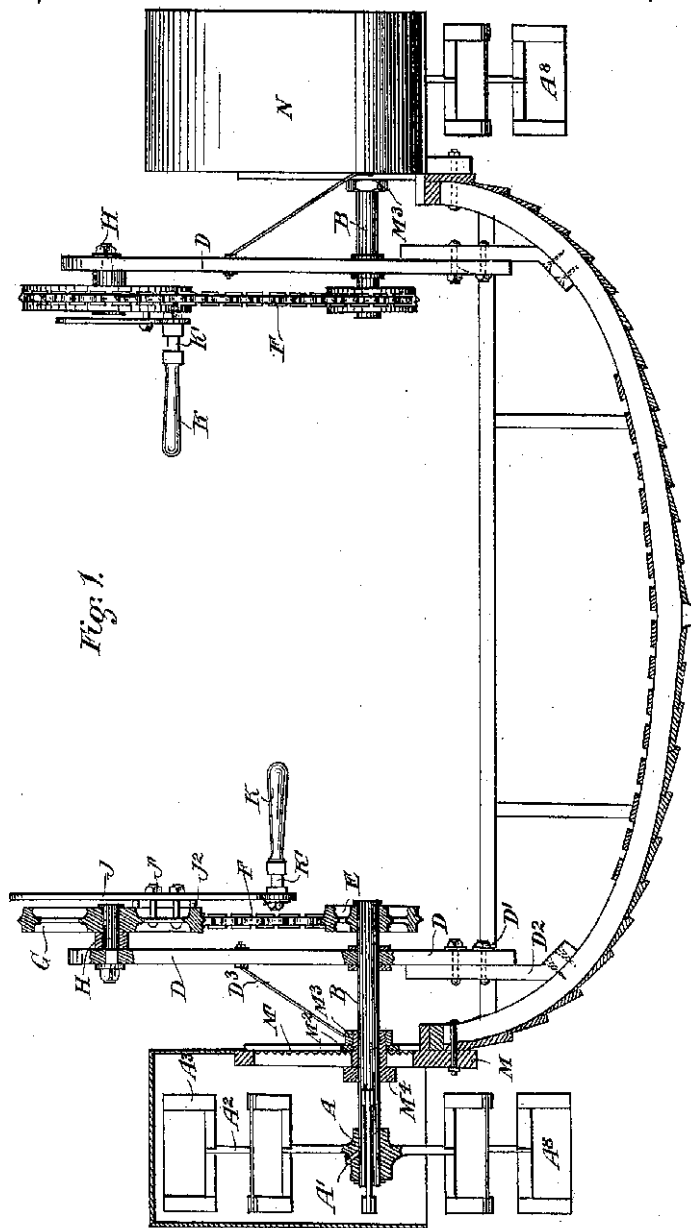
(No Model.)

2 Sheets—Sheet 1.

F. GILES.  
PROPELLER FOR BOATS.

No. 487,012.

Patented Nov. 29, 1892.



WITNESSES:  
A. D. Harrison  
H. E. Brown

INVENTOR:  
Frederick Giles  
by Wright, Brown & Connelley  
Attys.



(No Model.)

2 Sheets—Sheet 2.

F. GILES.  
PROPELLER FOR BOATS.

No. 487,012.

Patented Nov. 29, 1892.

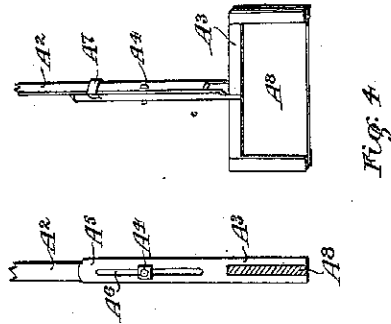


Fig. 4.

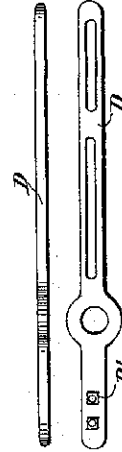
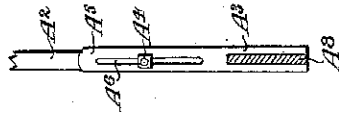


Fig. 5.

Fig. 3.

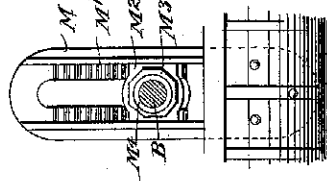


Fig. 6.

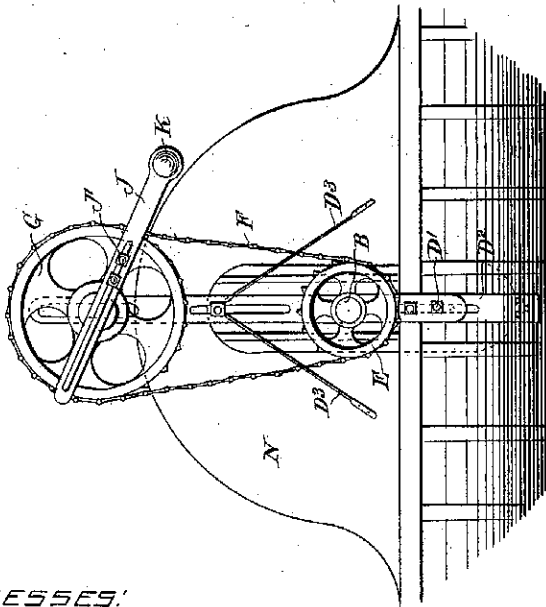


Fig. 2.

WITNESSES:  
A. D. Harrison  
H. C. Brown

INVENTOR:  
Frederick Giles  
by Wright Brown & Co. Attys.

# UNITED STATES PATENT OFFICE.

FREDERICK GILES, OF SOUTH YARRA, NEAR MELBOURNE, VICTORIA.

## PROPELLER FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 487,012, dated November 29, 1892.

Application filed May 23, 1892. Serial No. 433,974. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK GILES, engineer, a citizen of Melbourne, and a subject of the Queen of Great Britain, and a resident of Fawkner Street, South Yarra, near Melbourne, aforesaid, in the Colony of Victoria, Australia, have invented a certain new, useful, and Improved Apparatus for Propelling Boats by Hand-Power, of which the following is a specification.

This invention has been devised for the purpose of affording the public a convenient, cheap, and effective apparatus for propelling boats—such, for instance, as ordinary river and pleasure boats. In practice it is found that the pulling of boats by means of oars is a very laborious operation, particularly so to women or people of weak muscles on account of the strain on the arms, which it is necessary to exert in feathering and pulling paddles or oars. The use of my invention overcomes these objectionable features, and in addition the person propelling the boat may sit facing the direction in which the boat is proceeding. There being no through-shaft and each paddle having its own mechanism complete, the necessity of a rudder is obviated, and the boat may be steered by simply slackening or reversing one of the paddles. The apparatus may be amplified to suit any number of people in the boat. I would also point out that the labor exerted in the return or back stroke of oars is lost and that a boat so pulled proceeds on its course in a jerky or jumpy manner, whereas by my apparatus a boat can be made to travel at a steady and continuous speed. I am aware that paddle-wheels have been before used for propelling boats, but not in the peculiar manner in which mine are driven.

In order to explain my invention, I will now refer to the drawings, in which—

Figure 1 shows a cross-section of a boat fitted with my propelling apparatus, half of the said apparatus being in section and half in elevation; Fig. 2, a view of the apparatus from the interior of the boat, while Figs. 3, 4, 5, and 6 show detached views of some of the details of Figs. 1 and 2.

In the drawings, A is a paddle-wheel, which is set and fastened on a shaft B by means of a set-screw pin A'. The arms A<sup>2</sup> and blade-frames A<sup>3</sup> of the wheel A are specially con-

structed to admit of their extension or shortening, as required, and the details of which will be seen on Fig. 4, in which A<sup>2</sup> is a spoke of the wheel, specially shaped to engage by means of a through-bolt A<sup>4</sup> with a sliding box A<sup>5</sup>. This latter has an extended slot A<sup>6</sup> along a portion of its length, which receives the said bolt A<sup>4</sup> for the adjustment of the length of the paddle-arm.

On the sliding box A<sup>5</sup> is also mounted a limitation-strap A<sup>7</sup>. At the extremity of the said box the paddles are attached and consist of the frame A<sup>8</sup>, shaped to receive the paddle-blades A<sup>9</sup>, which are secured by means of a small screw. The shaft B passes through an adjustable bearing, thence through an upright adjustable frame D, and terminates in a small band and sprocket-wheel E. (See Figs. 1 and 2.) This wheel E is rotated through the medium of a chain F by a larger and somewhat-similar wheel G. This latter wheel G is centered and rotated on a peculiarly-constructed pin-shaft H, which may be moved up or down for setting at any level on the said upright frame D.

To the wheel G is attached an adjustable slotted bar J, Figs. 1 and 2, by means of through-bolts J', and stop-pins J<sup>2</sup> are provided for screwing against the said slotted bar terminating in a specially-constructed handle K, on a portion of which said handle is a groove or space K', the use of which will be explained hereinafter. The frame D is supported in its upward position by means of bolts D' and lower standard-frame D<sup>2</sup>. This said lower frame D<sup>2</sup> is also provided with an extended slot for use when lowering or raising the apparatus. Stay-rods D<sup>3</sup> are provided for imparting rigidity to the frame D. A forked rod L (see Fig. 6) is also provided, which is for use when a number of people are on, say, a pleasure excursion and are desirous of assisting the person propelling the boat, the fork L' fitting in the recess K', Fig. 1, the operator exerting power at the handle L<sup>2</sup>.

I will now proceed to explain the details of the apparatus for raising or lowering of the parts, in order that they may be adjusted to the drafts of different boats.

Referring particularly to Figs. 1 and 3, M is a framework of metal, which is affixed to the side of the boat by bolts or screws and

in which a large vertical slot is formed. On the inner side of the frame is arranged a vertical set of teeth M', in which a corresponding set of teeth engage. These latter teeth are formed in a block-washer M<sup>2</sup>, the said washer being kept in position by the strain of a nut M<sup>3</sup>.

M<sup>4</sup> is a block or bush of metal, which flanges outside of the frame M and proceeds through the slot in M and block-washer M<sup>2</sup>, where it engages with a screw and nut M<sup>3</sup>. Provision is also made to permit the adjustment of the frame D and its parts, (see Figs. 1, 2, and 5,) in which it will be seen that slots are provided for adjusting the top pin-shaft H and the stay-rods D<sup>3</sup>. Shield-boxes N are provided to prevent any splash-water coming into the boat.

The *modus operandi* of my invention is as follows: Rotary motion is imparted to the handles K by the operator. This will rotate the top wheels G and (by reason of the chains F) the lower wheels E, shafts B, and paddles A. Should the boat require steering, the operator may accelerate the motion of one of the paddles, and, if necessary, at the same time reverse the action of the other. Should he desire assistance from one or more people in the boat, the rods L (see Fig. 6) may be nicked into their places at K' and the rods L worked from other parts of the boat, any splash-water from the action of the paddles being prevented by the shield-boxes N. Presume that it is desirable to give the paddles less depth of immersion in the water, owing to the boat being heavily laden, or from any other cause, the screws D', stay-bolt D<sup>3</sup>, and the large nut M<sup>3</sup> are loosened. This will disengage the teeth in the rack M' and washer M<sup>2</sup> and permit the raising of the whole apparatus to the required height, at which the nuts may be again tightened and the apparatus is ready for use. Should it be desirable to al-

ter the radius at which the handle K is set, the bolts J' may be loosened and the slotted rod J altered as required. Oil-holes are conveniently arranged at the required parts for the purpose of lubrication.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a propeller for boats, the combination, with a vertically-adjustable bearing, of a propeller-shaft journaled therein, longitudinally-adjustable spokes secured on the shaft and carrying paddles, a sprocket-wheel on the shaft, a frame carrying a vertically-adjustable stud, a sprocket-wheel on the stud, and a sprocket-chain connecting the two wheels, as set forth.

2. In a propeller for boats, the combination, with the side or gunwale thereof, of a frame secured thereto having a plurality of serrations, a block having serrations adapted to be clamped into engagement with the serrations of the frame, a propeller-shaft journaled in the block and carrying a series of longitudinally-adjustable spokes provided with paddles, a sprocket-wheel on the shaft, a standard carrying a vertically-adjustable stud, a sprocket-wheel on the stud, a sprocket-chain connecting the two wheels, and a crank carried by the sprocket-wheel on the stud, said crank being axially adjustable, as set forth.

In witness whereof I hereunto set my hand in presence of two witnesses.

FREDERICK GILES.

Witnesses:

A. O. SACHSE,  
C. E., Melbourne.  
C. W. WADE,  
C. E., Melbourne.

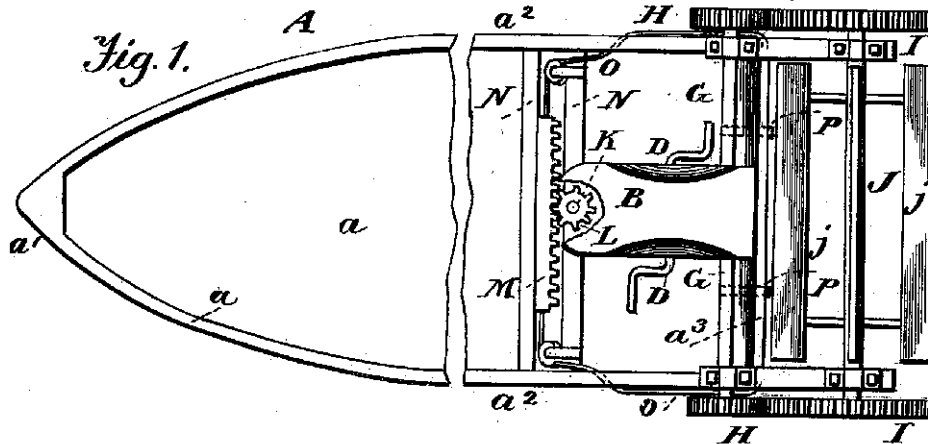
(No Model.)

J. R. MAHONEY.

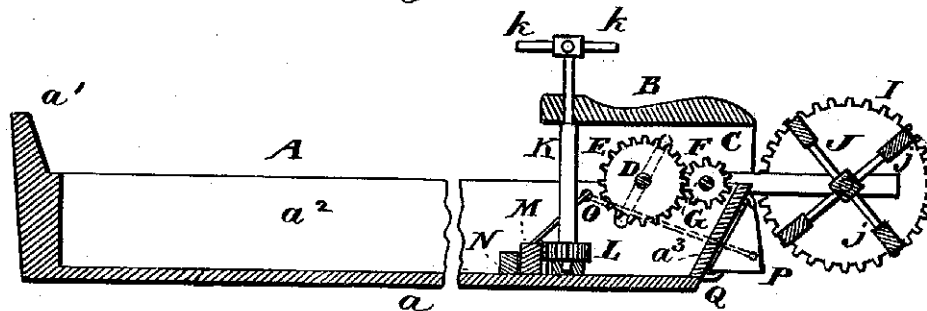
# PROPELLING MECHANISM FOR BOATS.

No. 509,133.

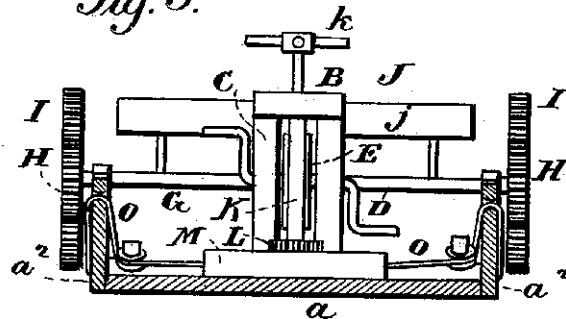
Patented Nov. 21, 1893.



*Fig. 2.*



*Fig. 3.*



Witnesses  
A. Rupert  
H. A. Daniels

Inventor  
John R. Mackney  
Per  
Thomas P. Simpkins  
Attorney

# UNITED STATES PATENT OFFICE.

JOHN R. MAHONEY, OF SISTERSVILLE, WEST VIRGINIA.

## PROPELLING MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 509,133, dated November 21, 1893.

Application filed April 28, 1893. Serial No. 472,191. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN R. MAHONEY, a citizen of the United States, residing at Sistersville, in the county of Tyler and State of West Virginia, have invented certain new and useful Improvements in Propelling Mechanism for Boats; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The special object of the invention is to make a propeller which may be operated and steered by one person, the boat being of shallow draft and requiring a small power to carry it along through the water.

Figure 1 of the drawings is a plan view; Fig. 2 a median longitudinal section, and Fig. 3 a transverse vertical section.

In the drawings, A represents the body of the boat having the flat bottom  $a$ , the sharp prow  $a'$ , sides  $a^2 a^3$  and stern  $a^4$ , the latter being preferably made to incline outwardly from the bottom upward.

B is the boatman's seat supported on two parallel walls or board uprights C C in which is journaled a crank or pedal shaft D made fast to the drive wheel E between said walls. Sitting on the seat B, the boatman rotates the crank shaft D with his feet and turns the spurwheel E which gears with a spurwheel F on the shaft G and fast to the middle thereof. The wheel F rotates shaft G and its fast end-wheel H which turn the end wheels I I on the propeller J. Of course, I may use sprocket chain and wheels or belts and pulleys instead of spurgears to connect the driveshaft with the propeller, as they are well known operative mechanisms.

The stern wheel propeller J may have two or more radial paddles  $j$ , but I prefer four as shown in the drawings. The shafts D are journaled in or on the sides  $a^2 a^3$  while the propeller shaft is journaled in an extension thereof beyond the rear of the boat.

K is the steering post with the radial handles  $k$  at top and the pinion L at the bottom. This pinion reciprocates in either direction, the rackbar M between the two guides N N, the said rackbar being connected by the ropes O O with the rudder plates P, P, turning on the pintles Q Q affixed to the rear of the boat.

The spur or sprocket wheels of the driving shaft may be varied in their relative diameters so that the rotation of the drive shaft will rotate the propeller an equal, greater or less number of times. Of course, the speed of the boat will be decreased as the required power is lessened to give a revolution to the drive shaft.

Having thus described all that is necessary to a full understanding of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The boat A having a box seat B at the rear end, a crank-pedal shaft journaled under said seat and carrying in the middle thereof a spurwheel E, a countershaft G with a middle pinion F gearing with wheel E and two end-pinions H H, and a paddle wheel on a shaft with end-wheels which gear with the pinions H H, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN R. MAHONEY.

Witnesses:

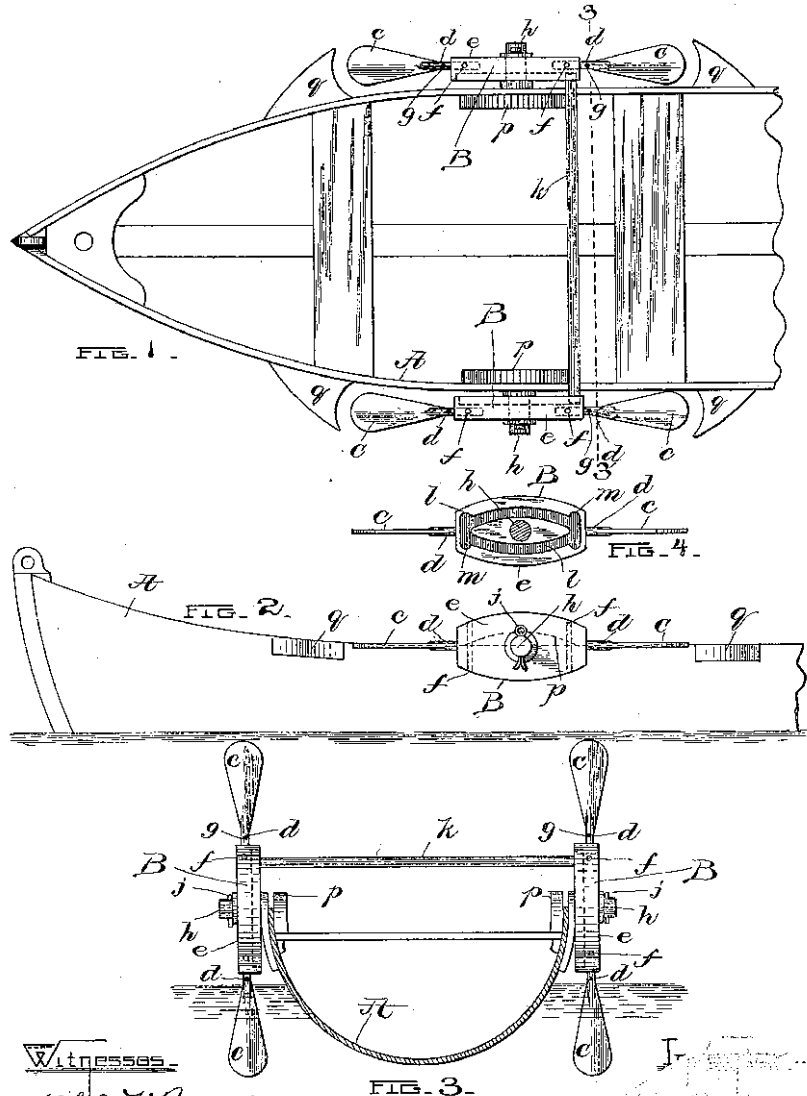
P. B. LOWRY,  
J. C. WAY.

(No Model.)

J. F. BLISS.  
BOAT PROPELLING DEVICE.

No. 511,748.

Patented Jan. 2, 1894.



Witnesses

Arthur F. Randall,  
Robert Wallace.

FIG. 3.

James F. Bliss  
by Marshall Hall  
attorney

# UNITED STATES PATENT OFFICE.

JAMES F. BLISS, OF BOSTON, MASSACHUSETTS.

## BOAT-PROPELLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 511,748, dated January 2, 1894.

Application filed December 28, 1892. Serial No. 456,596. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. BLISS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Boat-Propelling Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object an improved device for propelling boats and it consists in a rotary paddle and means for rotating the same, all constructed and arranged as herein-after set forth.

The novel features of my device are pointed out in the claims which are appended hereto and made a part hereof.

I have shown my invention embodied in the best form now known to me in the accompanying drawings, in which—

Figure 1 is a plan view of a boat partially broken away with my device applied thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a section on line 3—3 Fig. 1 but showing the paddles in vertical position. Fig. 4 is a

securing pin *f* and moving the blade farther out of its socket or shoving it farther into the socket and placing the pin *f* in another one 55 of the holes *g*, which are provided in the shank of the blade. This arrangement is convenient because if the boat be heavily loaded it will sit lower in the water and the paddles will not require to be so long whereas if the boat be 60 lightly loaded the paddles may be required to be lengthened to take the water properly. The central portion of the paddle *e* is set on a pin or stud *h* which is secured on the side of the boat in any convenient manner. The 65 outer end of the pin is preferably provided with a securing-pin *j*. By withdrawing this pin the paddle may be readily unshipped when desired. For the purpose of rotating the paddle the central portion thereof is provided 70 with a cross-bar *k* which may be of any suitable material and which extends across the boat to the paddle on the opposite side thereof. The ends of the cross-bar are set in grooves *l* in the body portions of the paddles and are 75 free to slide from end to end of these grooves. At the ends of the grooves are

as shown Fig. 1 with a fender plate or series of plates *g* secured to the gunwale or sides of the boat the boat may be run alongside a wharf or another boat without danger of carrying away the paddles or damaging them.

5 What I claim is—

1. The combination with a pair of rotary paddles, of the actuating cross-bar *k* between them, the ends of the said cross-bar being engaged with the said paddles with capacity to  
10 slide along the latter from one side to the other of the pivots of the paddles, substantially as described.

2. A boat propelling device embracing two  
15 rotary paddles, one for each side of the boat, each of said paddles consisting of a grooved body portion provided with adjustable blades and means for rotating said paddles, consisting of a cross-bar engaging the grooved portions substantially as set forth.

20 3. A boat propelling device consisting of rotary paddles provided with grooves and a co-

operating cross-bar *k*, the ends of said cross-bar being arranged to slide in said grooves, substantially as set forth. 25

4. In a boat propelling device the combination with a pair of rotary paddles having grooved body portions of a cross-bar engaging with said grooved portions for operating the paddles and the guide blocks *p*, substantially  
30 as set forth.

5. In a boat propelling device the combination of a rotary paddle consisting of a body portion provided with oppositely extending blades and having grooves therein with recesses at the ends thereof and an operating  
35 bar *k* engaging said paddle in said grooves, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES F. BLISS.

Witnesses:

WM. A. MACLEOD,  
ROBT. WALLACE.



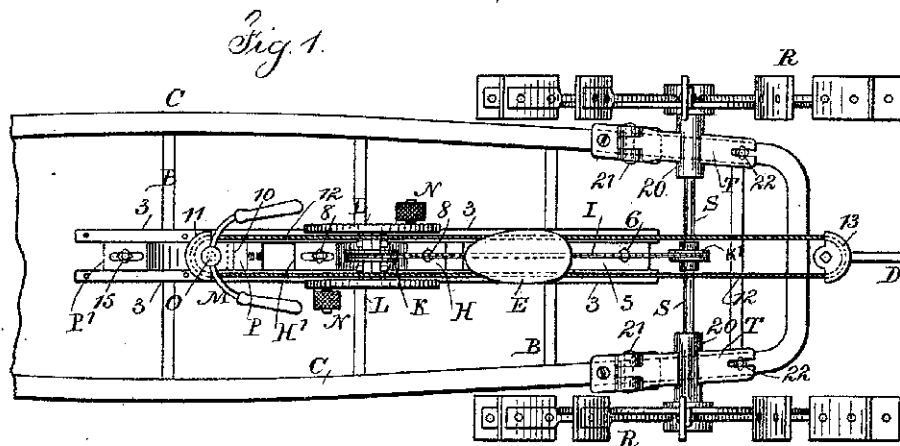
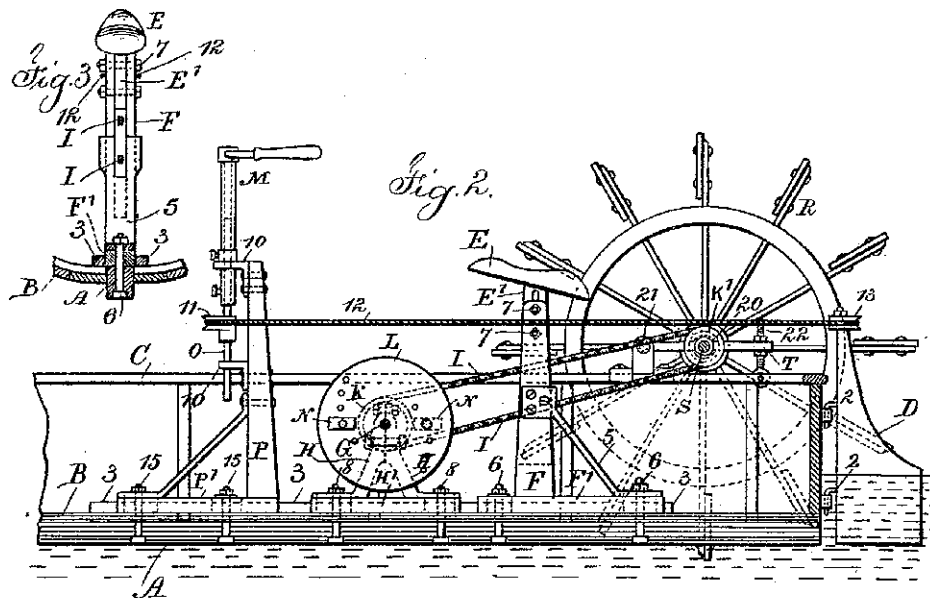


(No Model.)

G. BOLD & J. E. OLDHAM.  
FOOT POWER FOR PROPELLING BOATS.

No. 514,640.

Patented Feb. 13, 1894.



Witnesses,  
Chas H Smith  
J. Staib

Inventors  
George Bold  
James E. Oldham  
per Lemuel W. Perrell Atty.

# UNITED STATES PATENT OFFICE.

GEORGE BOLD AND JAMES E. OLDHAM, OF PLAINFIELD, NEW JERSEY.

## FOOT-POWER FOR PROPELLING BOATS.

SPECIFICATION forming part of Letters Patent No. 514,640, dated February 13, 1894.

Application filed September 11, 1893. Serial No. 486,228. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE BOLD and JAMES E. OLDHAM, citizens of the United States of America, residing at Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Foot-Power for Propelling Boats, of which the following is a specification.

The present improvements relate to the peculiar construction and arrangement of devices by which a saddle for the person propelling the boat is adjusted in reference to the pedals that are used for rotating balance wheels and a sprocket wheel for a chain leading to the propeller. The support for the sprocket wheel is adjustable lengthwise of the boat for tightening the chain, and an adjustable post and handle bar are provided with a connection to the rudder.

In the drawings, Figure 1 is a plan showing the improvement within the stern of a boat. Fig. 2 is an elevation of the same partially in section, and Fig. 3 is a cross section of the keel and slide way for the support.

The boat is of any desired size or shape. We have shown part of a boat with the keel A, ribs and planking B and gunwale C, and at D is the rudder supported on the pintles 2 2.

Along on the bottom of the boat the strips 3 3 are permanently fastened adjacent to or upon the top surface of the keel A, and these form a slide-way for receiving and supporting the respective parts of the mechanism and in which slide-way such parts may be adjusted longitudinally of the boat.

The saddle E is adapted to receive the driver that propels the boat. This saddle is upon the bar E', that is adjustable vertically within the divided post F that is permanently connected with the base F' and strengthened by the brace 5. The base F' fits between the strips 3 3 and is movable longitudinally of the boat in the slide-way, and there are bolts 6 passing through slots in the base and into the keel for securing the saddle post and saddle in position when adjusted; and by the clamp bolts 7 passing through holes or slots, the saddle bar E' and the saddle can be held rigidly when the saddle is adjusted to the

H that are upon the base H' that is fitted to slide longitudinally of the boat in the slide-way between the strips 3 3, and the bolts 8 passing through slots in the base H' and into the keel serve to hold the parts when adjusted, the object of the adjustment being to tighten the chain I that passes around the sprocket wheel K upon the pedal shaft G and is led to a sprocket wheel on the propelling device.

The fly-wheels L upon the outer ends of the shaft G receive the pedals N, which pedals are of any suitable character and adapted to the feet of the person driving the boat. They are preferably at one hundred and eighty degrees apart. The fly-wheels serve to render the rotation of the propelling device regular and uniform. There are holes in the fly-wheels at different distances from the shaft, so as to set the pedals at greater or less distances from the axis of rotation.

In order to steer the boat, we make use of the handle bar M having a vertical spindle O that passes through the brackets 10 on the steering post P and is provided with a segment 11 or cross bar with cords or ropes 12 to the segment or cross bar 13 on the rudder head, and the steering post P is adjustable longitudinally of the boat so as to be in the most convenient place for the person driving the boat. With this object in view the base P' of the steering post is in the slide-way between the strips 3 and held by screws or bolts 15 passing through slots in the base P' into the keel.

The devices before described are adapted to any kind of propeller; we however have shown and prefer to use the paddle wheels R upon the cross shaft S, upon which shaft is the sprocket wheel K' for the chain I, and by varying the relative sizes of the sprocket wheels K and K', the revolutions of the propelling wheel can be greater or less than the pedal shaft. The slotted base H' allows for adjusting the parts to suit different sizes of sprocket wheels with the same chain.

In foot power boats the draft varies according to the number of persons in the boat and it is important to be able to raise or lower

gunwale of the boat, and the screws 22 are also pivoted at their lower ends upon the gunwale and pass through slots in the levers T and the nuts upon the screws above and below the levers hold the parts and allow for raising or lowering the paddle shaft and wheels.

The chain I passes through the two part post F so as to be out of the way of the feet and legs of the person driving the boat.

In place of the screws 22, wedges may be used or slotted wedges may be put under the levers T in place of the lower nuts on the screws.

We claim as our invention—

1. The boat having strips 8 secured upon the bottom of the boat adjacent to the keel and forming a longitudinal slide-way, in combination with the saddle and its post and base.

nally of the boat, and a chain from the sprocket wheel to the propelling device, substantially as set forth.

2. The combination with the boat and a paddle wheel and shaft, of a saddle, a two-part saddle post and base, a sprocket wheel and shaft, and fly-wheels and pedals, a support and base for the sprocket wheel shaft, and bolts passing through slots in the bases and adjustably securing the same to the keel, a sprocket wheel on the paddle shaft and a chain from the same to the driving sprocket wheel, said chain passing through the divided saddle post, substantially as set forth.

Signed by us this 2d day of September, 1893.

GEORGE BOLD.

JAMES E. OLDHAM.

Witnesses to signature of Bold:

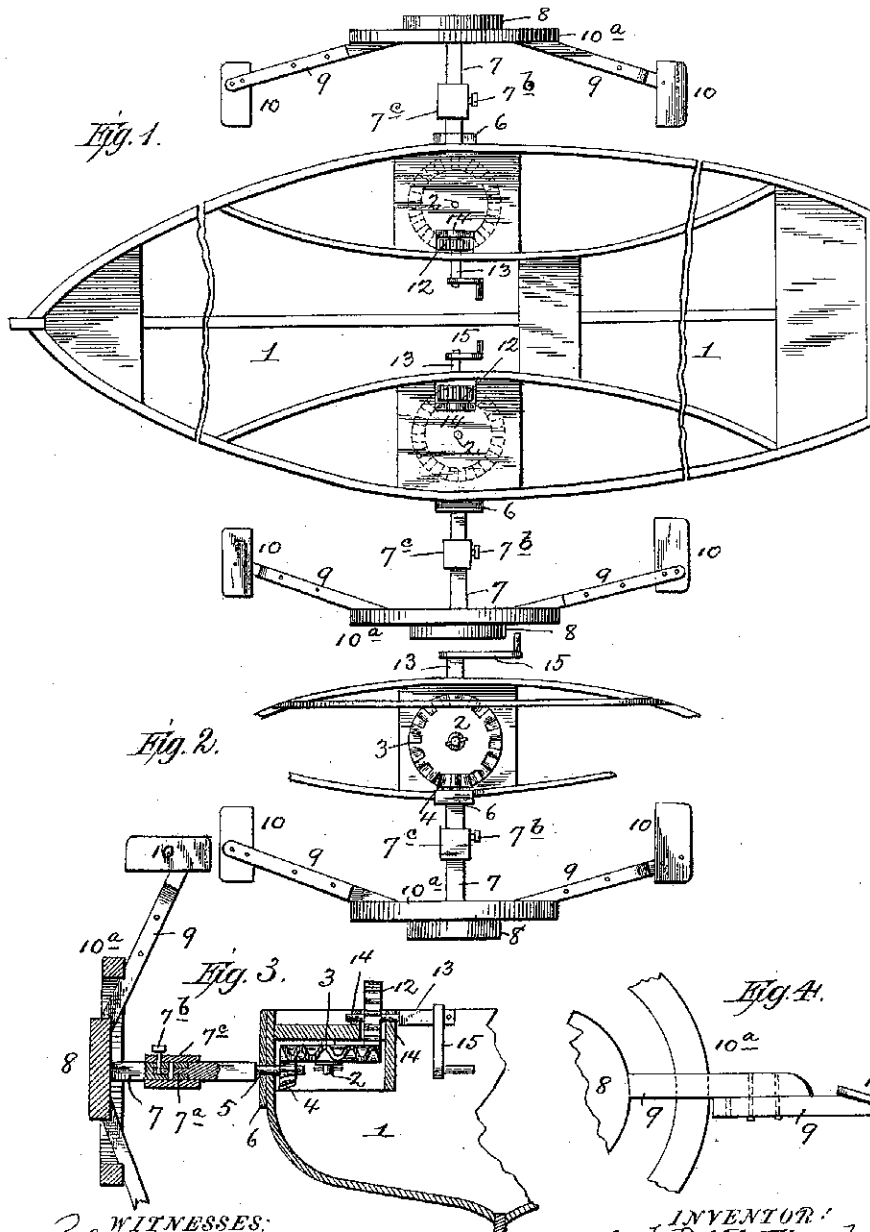


(No Model.)

F. P. McELFRESH.  
BOAT PROPELLER.

No. 518,072.

Patented Apr. 10, 1894.



WITNESSES:  
F. L. Curran  
M. L. Blooms

INVENTOR:  
Frank P. McElfresh,  
By Louis C. Rogers & Co.  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

FRANK P. McELFRESH, OF KIMBALLTON, IOWA.

## BOAT-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 518,072, dated April 10, 1894.

Application filed July 17, 1893. Serial No. 480,726. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK P. McELFRESH, a citizen of the United States, and a resident of Kimballton, in the county of Shelby and State of Iowa, have invented certain new and useful Improvements in Boat-Propellers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in boat propellers, and its object is to provide an improved construction of the same which shall possess superior advantages with respect to efficiency in use.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings: Figure 1 is a plan view of a boat with my improvements applied thereto. Fig. 2 is a detail bottom view. Fig. 3 is a detail sectional view. Fig. 4 is a detail view of one of the adjustable arms and its paddle.

In the said drawings, the reference numeral 1 designates the boat which may be of any ordinary construction. Journaled on a depending shaft 2, secured to the boat at each side thereof is a crown-wheel 3 which meshes with a pinion 4 on a shaft 5 journaled in bearings 6. Pivoted to the outer end of this shaft 5 is a shaft 7, the inner end of which is bifurcated and provided with a hole or aperture. In the bifurcated end of this shaft fits the reduced end 7<sup>a</sup> of shaft 5, which is formed with an aperture registering with the apertures in shaft 7. These shafts are connected together by a removable pin 7<sup>b</sup> which passes through an aperture in a slidable sleeve 7<sup>c</sup> embracing the ends of said shafts and also through apertures in said ends. The outer ends of shafts 7, are provided with hubs 8, to which are adjustably secured a series of inclined arms 9 provided with paddles 10,

which arms are braced and held in place by a ring 10<sup>a</sup>. Also meshing with the crown-wheel 3 is a pinion 12 on a shaft 13, journaled in bearings 14. This shaft is provided with a crank 15.

The operation will be readily understood: To propel the boat, the shaft 13 is rotated by means of the crank, which through the medium of the crown-wheel, pinion 4, and the shafts, rotates the hub 8 and paddles 10; the operation being similar to any ordinary paddle wheel. When the boat is not in use the pins 7<sup>b</sup>, are removed, the sleeves slipped outwardly so that the paddles can be turned up over the boat and secured so that they cannot be operated.

It will be noticed that the arms 9 are adjustable so that their length may be regulated, and the object of having them inclined inwardly is to prevent injury thereto by coming into contact with other objects.

Having thus described my invention, what I claim is—

1. The combination with a boat of the horizontal crown-wheels, the transverse shafts having a pinion engaging with said crown-wheels, the shafts pivoted to said transverse shafts, the hubs carried thereby, the inwardly inclined adjustable arms secured to said hubs and provided with paddles, the pinions meshing with said crown-wheels and their shafts and cranks; substantially as described.

2. The combination with a boat, of the rotatable shafts at each side thereof, and means for operating the same, the shafts pivoted thereto, the slidable sleeves, the removable pins for holding said sleeves in place, the hubs, the inwardly inclined arms having paddles and the brace ring; substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

FRANK P. McELFRESH.

Witnesses:

JOSEPH STILES,  
J. B. WHITNEY.

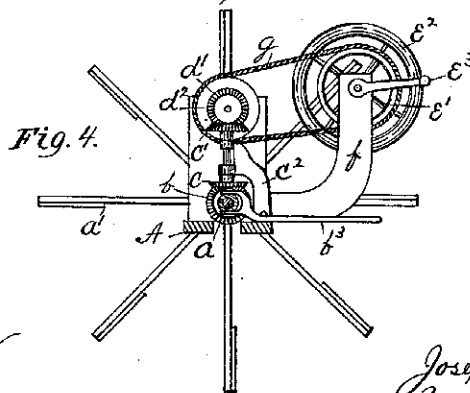
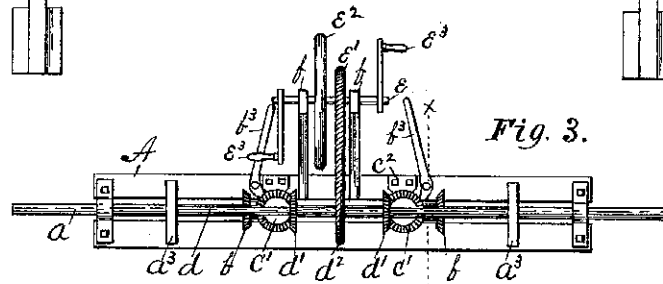
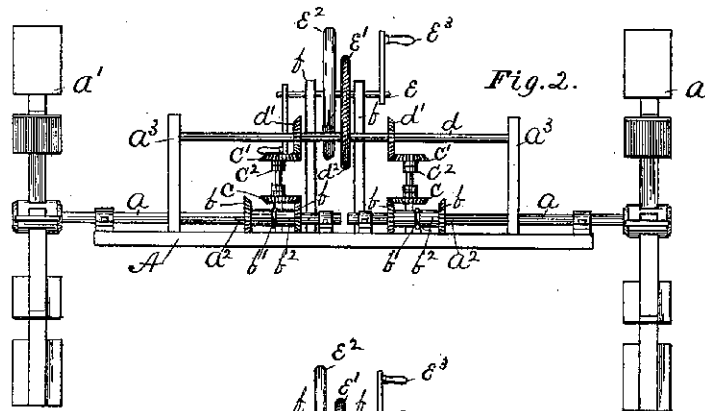
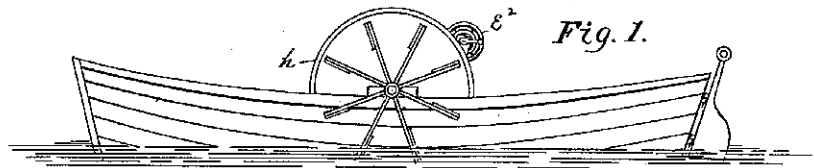
(No Model.)

J. C. THOMAS.

PADDLE WHEEL MECHANISM FOR PROPELLING BOATS.

No. 520,944.

Patented June 5, 1894.



Witnesses  
Fred A. Mason  
S. E. Bain

Inventor  
Joseph C. Thomas  
By H. M. Mason atty.



# UNITED STATES PATENT OFFICE.

JOSEPH C. THOMAS, OF NEW BEDFORD, MASSACHUSETTS.

## PADDLE-WHEEL MECHANISM FOR PROPELLING BOATS.

SPECIFICATION forming part of Letters Patent No. 520,944, dated June 5, 1894.

Application filed January 22, 1894. Serial No. 497,616. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH C. THOMAS, a citizen of the United States, residing at New Bedford, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Mechanism for Operating Paddle-Wheels for Propelling Boats, of which the following is a specification.

The object of my invention is to provide means whereby the motion of the paddle wheels of a boat may be reversed, caused to turn in opposite direction with each other at the same time, or turn in either direction independently of each other, without reversing or stopping the propelling power; and also to provide a mechanism which can be easily placed across the gunwales of a small boat to

band, connecting the wheel  $d^2$ , and a wheel  $e'$  which is mounted on a shaft  $e$ , having bearings in uprights  $f$ , and provided with cranks  $e^2$ .  $e^2$  is a balance wheel on said shaft  $e$ .

$b^3$ ,  $b^3$ , are levers, pivoted to the base  $A$ , and provided with forks adapted to embrace the sleeves  $b^2$ , whereby said sleeves, and gears  $b$ , secured to them, are moved longitudinally on the shafts  $a$ .

The operation of the device, when applied to a small boat as illustrated in Fig. 1, is as follows:—The base  $A$ , being placed across the gunwales of the boat and secured thereon, the operator takes his place behind the wheel  $e'$ , and revolves the same by means of the cranks  $e^2$ . To propel the boat in a forward direction, the sleeves  $b^2$  are both moved in.

a boat, and be removably secured thereto, consisting of the paddle wheels  $a'$ , mounted on independent shafts  $a$ ; the sleeves  $b^2$ , one on each shaft, provided with bevel gears  $b$ , and adapted to be shifted longitudinally on said shafts, and to revolve therewith; the gears  $c$ , and  $c'$ , mounted on shafts, having their bearings in stands  $c^2$ ; a shaft  $d$ , mounted in bearings, and bearing bevel gears  $d'$ ,  $d'$ , adapted to mesh with the gears  $c'$ , and

provided with the chain or band wheel  $d^2$ ; a shaft  $e$ , mounted in bearings  $f$ , and provided with cranks  $e^2$ , and a chain, or band wheel  $e'$ , connected with the wheel  $d^2$ , on the shaft  $d$ , by a chain or band, all as shown and for the purpose described.

JOSEPH C. THOMAS.

Witnesses:

HENRY W. MASON,  
S. E. BAIN.

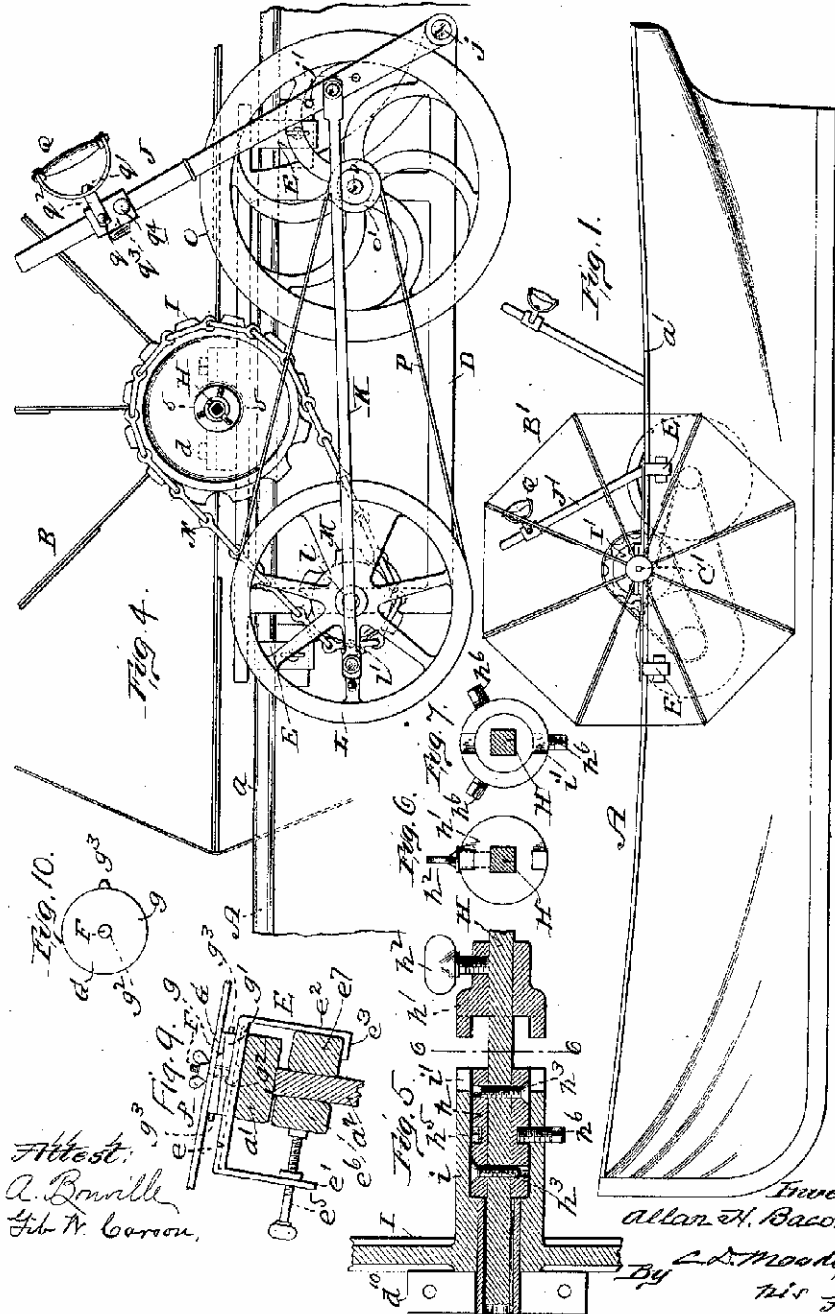
(No Model.)

2 Sheets—Sheet 1.

A. H. BACON.  
BOAT PROPELLING MECHANISM.

No. 524,629.

Patented Aug. 14, 1894.



Attest:  
A. Bonville  
J. W. Carron,

Inventor  
Allan H. Bacon  
By C. S. Moody  
his Attorney

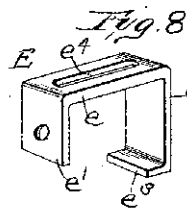
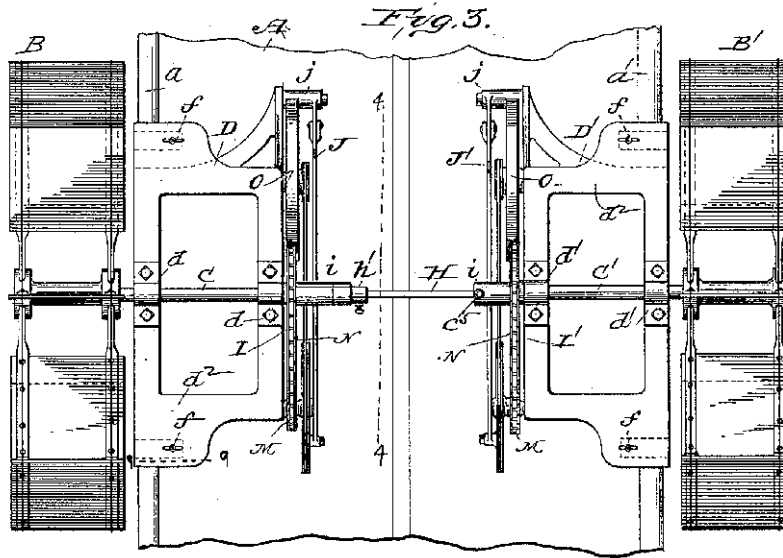
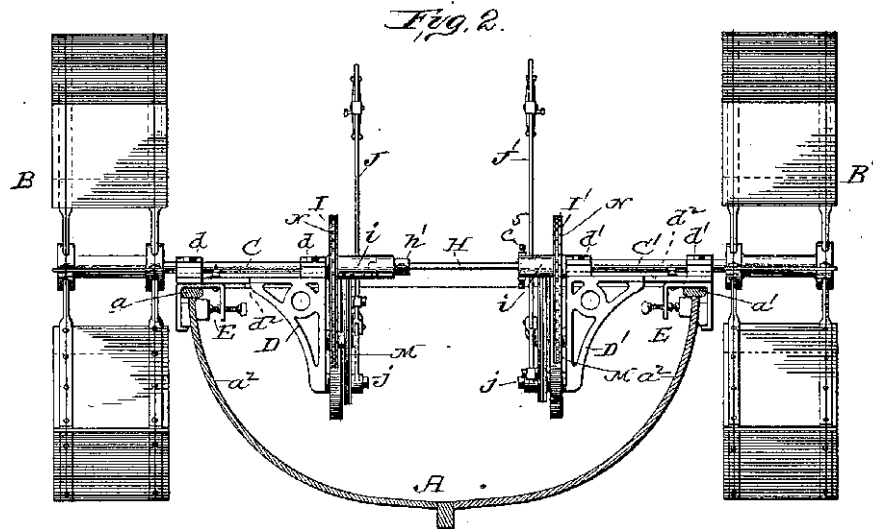
(No Model.)

2 Sheets—Sheet 2.

A. H. BACON.  
BOAT PROPELLING MECHANISM.

No. 524,629.

Patented Aug. 14, 1894.



Attest:  
A. Bonville  
Atty. W. Carson.

Inventor:  
Allan H. Bacon  
By [Signature] Atty

UNITED STATES PATENT OFFICE.

ALLAN H. BACON, OF WEBSTER GROVES, MISSOURI.

### BOAT-PROPELLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 524,629, dated August 14, 1894.

Application filed September 26, 1893. Serial No. 486,429. (No model.)

*To all whom it may concern:*

To all whom it may concern:

Be it known that I, ALLAN H. BACON, of Webster Groves St. Louis county Missouri

claim attached to the boat and including a portion of the plumber block, and Fig. 10 a plan of the said instable washer employed in lav-

[illegible]

a mechanism such as is under consideration to be attachable to the boat at various points in its length, provision is made for supporting the plumber-block horizontally irrespective of the inclination of the gunwale, and also for adapting the plumber block to the taper of the boat. That is, it frequently happens that the top of the gunwale, in place of being horizontal at the point of the attachment of the plumber block as in Fig. 2, is more or less inclined as indicated in Fig. 9, and in such case it is essential to employ means to support the plumber block in a level position. As the most desirable means to this end I employ an adjustable washer G, which is inserted between the clamp and plumber-block top as in Figs. 9 and 10. This washer consists of a pair of circular wedge shaped disks  $g, g'$ , perforated centrally at  $g^2$  to enable the disks to be rotated upon each other around a common pivot, such for instance at the bolt F. When the disks are arranged as in Fig. 9, that is, with the thin part of one disk opposite the thick part of the other disk, the combined disks are of uniform thickness and the plumber block top is held parallel with the top of the clamp, and in the case of a horizontal gunwale the washer is really not needed. But by turning the disks,  $g, g'$ , around upon each other so that the thinnest part of one of them does not coincide with the thickest part of the other, the washer as a whole becomes more or less wedge-like in shape, and the plumber block in consequence is held more or less out of parallel with the clamp. (That is, the plumber block-top can be held level upon an inclined gunwale.) As the top and bottom faces of the washer are more or less inclined to each other according to the extent to which the disks are turned upon each other, the washer is adaptable to the various inclinations of the clamps in use. To facilitate the turning of the disks  $g, g'$ , each of them may have a projection  $g^3$ , or any equivalent means, by which the disk can be readily grasped, or taken hold of, and turned around. In this manner each plumber block can be attached horizontally to the boat. And to suit the shape of the boat, which usually tapers from its middle toward each end thereof, and at the same time enable the paddle wheels to be held parallel and opposite each other, provision is made for adjusting the plumber block upon the clamp in a horizontal direction, and so that the block-top at one outer corner thereof may project outward from the boat more than at its other outer corner. For this purpose the slot in the top of the clamp is brought into use: as the plumber block is shifted toward the end of the boat the outer edge of its top becomes more and more out of parallel with the gunwale, and in such case the bolt which connects the clamp and the plumber block is shifted in the slotted clamp-top, as indicated in Fig. 9, to suit the position of the plumber block above it. It is undesirable to connect

the plumber blocks with the boat saving at the gunwales thereof. In such case however the inner portion of each plumber block tends to sag. I substantially prevent this by connecting the shafts C, C', by means of some rigid connection which shall operate, so far as this feature of the construction is concerned, to brace the paddle wheel shaft from one side of the boat to the other. The preferable mode of accomplishing this is to connect the shafts C, C', by means of a bar H which at its ends is connected with the shafts. Said shafts, at least at the inner portion thereof, are tubular, and the bar H, at its ends respectively, is inserted in said shafts, and in any suitable manner to prevent the shafts and the plumber blocks respectively thereto attached from sagging. The shaft H is angular, and preferably square, in cross section. The shafts, C, C', are provided with sprocket wheels I and I', respectively. The wheels are fast upon their shafts, and one, I, of them, and preferably both of them, have an extended hub  $i$ . If it were designed to permanently connect the paddle wheel shafts C, C' the bar H might be permanently connected with the ratchet wheels or the shafts C, C'. One, I', of said wheels is preferably so connected. But to enable the paddle wheels to be independently rotated the connection of the bar with one of the wheels, say the wheel I, is a detachable one. This is illustrated in Figs. 5, 6, and 7. The bar H is provided with or constructed to form a cylindrical bearing  $h$ . A clutch part,  $h'$ , is also mounted on the bar. The hub  $i$  of the wheel I is fitted to receive the bearing  $h$  of the shaft, and the wheel hub and bearing are thus adapted to turn upon each other; the hub  $i$  has a clutch part,  $i'$ , adapted to coact with the clutch-part  $h'$ , and by slipping said last named part upon the bar H into engagement with the clutch-part  $i'$  the shafts C, C', and their wheels are united to turn together. Therefore when it is desired to connect the wheels so that they shall rotate together the clutch part  $h'$  is slipped upon the square rod H into engagement with the hub  $i$ , and is tightened upon the rod by means of the set screw  $h^2$ . And to enable either wheel to be used independently of the other the clutch part  $h'$  is loosened and withdrawn from the clutch-part  $i'$  as shown in Fig. 5. The bearing  $h$  can be attached to, or formed upon, the bar H in any suitable manner, and in the present instance it is shown as a sleeve and is fastened to the bar by means of the screws  $h^3$ . To interlock the bar H endwise with the shaft C and wheel I the sleeve  $h$  is grooved at  $h^4$ , and screws  $h^5$  pass through the hub  $i$  and engage in said groove as shown in Fig. 5. This permits of the shafts C, C', being rotated independently of each other, but at the same time connects the shafts longitudinally.

The means for effecting the rotation of the paddle-wheel shafts is as follows: J represents a lever pivoted at  $j$  to the plumber

block D. A pitman, K, connects said lever with a crank L fastened to a shaft  $l$ , that is journaled in the plumber-block. Said last named shaft is also provided with a sprocket wheel M, from which a chain, N, leads to the sprocket wheel L. The vibration of the lever J upon its pivot therefore effects the rotation of the wheel I and the shaft to which it is attached. The pitman, as indicated by the series of holes  $j'$ , can be connected with the lever J at a point nearer to or farther from the pivot  $j$ , and when more leverage is required the connection is made nearer to the pivot  $j$ , and when less the connection is made farther from the pivot. The pitman also has an adjustable connection with the crank, and for an analogous purpose; when more leverage is required the pitman is connected with said crank at a point farther from the shaft  $l$ , and when less leverage is required the connection is made at a point,  $l'$ , nearer to shaft  $l$ . To better insure the keeping of the pitman off the dead center a fly wheel, O, is used. Said fly wheel is journaled upon a bearing, o, upon the plumber-block, and it is provided with a pulley, o', from which a belt, P, leads to the crank L which, for this last named purpose, is in the form of a pulley, substantially as shown. Thus connected the fly wheel is rotated whenever the lever J is operated, and it acts in the usual manner of a fly-wheel for the purpose in question.

To facilitate the operation of the lever J that part is provided with a handle Q, which the person propelling the boat grasps. The handle is pivoted at  $q$  to enable it to be turned vertically, and the handle is also journaled at  $q'$  to the handle-arm  $q^2$  to enable the handle to be turned in a direction more or less at right angles to the plane in which it can be swung when turned upon its pivot  $q$ . The handle in this manner has a universal connection with the lever, and the operator, whether standing or sitting in the boat, can more readily and effectively operate the lever than if he had to grasp the lever directly, or than if the handle were rigidly connected with the lever. A third adjustment of the handle is provided for: The handle instead of being attached directly to the lever is attached to a sleeve,  $q^3$ , which can be slipped upward and downward upon the lever, and can be fastened at the desired point thereon by means of the set screw  $q^4$ . In this manner the leverage can be lengthened or shortened according as the sleeve is moved from or toward the pivot  $j$ . The mechanism for operating the other wheel-shaft, C', is of a similar nature; that is, J' represents a lever pivoted to the other plumber block, D', and similarly geared to the sprocket wheel I', and capable of being similarly adjusted and operated. When the two shafts, C C', are connected to rotate together the two paddle-wheels can be driven by means of both of the levers, J and J', or by either thereof, and in such last men-

tioned case one hand of the operator may be free to be used for other purposes. And when the shafts C, C', are capable of independent rotation either one, or both together, can be rotated by operating either one or both of the levers. In all cases it is desirable for the propelling-mechanism to be braced, by means of the bar H, across the boat as described. The present mechanism, as is apparent, is readily detachable from the boat.

To enable the present mechanism to be adjusted to boats of different widths the cross-bar H is adapted to be inserted a longer or a shorter distance into one or both of the wheel-shafts. In the present instance such endwise adjustment can be made in the shaft C', and by means of the set screw  $c^5$ , the bar can be fixed in the shaft. The washer G being adapted for use in many other constructions I desire not to be restricted in its use to the present boat-propelling mechanism.

I claim—

1. In a boat propelling mechanism, the combination with the clamp consisting of the top having a slot therein, the downwardly projecting arms, one of which is provided with an inwardly projecting flange, and the clamp screw, of the plumber block, the bolt passing up through the slot in said clamp and connected with the plumber block, and the paddle shaft, provided with paddles, journaled on said plumber block, substantially as described.

2. In a boat propelling mechanism, the combination with the clamp consisting of the top having a slot therein, the downwardly depending arms, one of which is formed with an inwardly projecting flange, and the clamp screw, of the bolt passing through said slot, the plumber block connected therewith, the rotatable wedge shaped washers interposed between said clamp and plumber block, and the paddle shaft and paddles, substantially as and for the purpose specified.

3. The combination of the plumber-block, the lever J pivoted in said block, the crank-shaft operated by said lever, the sprocket wheel on said shaft, the wheel-shaft, the sprocket wheel on said shaft, pitman, connecting said lever and the crank and the belt connecting said sprocket wheels, substantially as described.

4. The combination of the plumber-block, the pivoted lever J, the crank-shaft, the sprocket wheel on said shaft, the pitman, connecting said lever to the crank the wheel-shaft, the sprocket wheel on said shaft, and the belt connecting said sprocket wheels, said pitman having an adjustable connection with said lever, substantially as described.

5. The combination of the plumber-block, the pivoted lever J, the crank-shaft, the sprocket wheel on said shaft, the pitman connecting said lever to the crank, the wheel-shaft, the sprocket-wheel on said shaft, and the belt connecting said sprocket wheels, said

pitman having an adjustable connection with said lever and with said crank-shaft, substantially as described.

6. The combination of the plumber-block,  
5 the pivoted lever J, the crank-shaft, the  
sprocket wheel on said shaft, the pitman connecting said lever to the shaft, the wheel-shaft,  
the sprocket wheel on said shaft, the belt connecting said sprocket-wheels, the fly wheel O,  
10 journaled upon a bearing o, upon said plum-

ber block, the fly-wheel pulley, and the belt P, leading to crank L, whereby said fly wheel is operated when the lever J, is moved substantially as described.

Witness my hand this 23d day of September, 1893.

ALLAN H. BACON.

Witnesses:

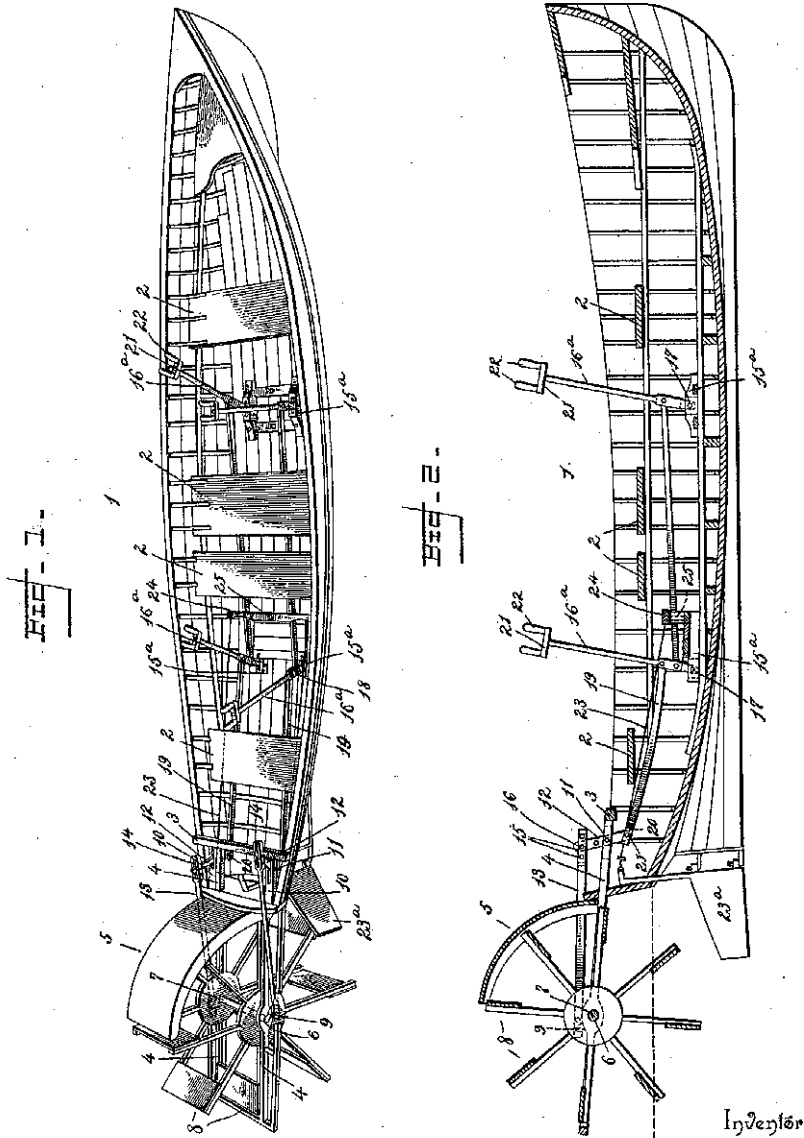
C. D. MOODY,  
L. W. STEBBINS.

(No Model.)

J. S. MARTIN.  
MARINE PROPULSION.

No. 527,798.

Patented Oct. 23, 1894.



Inventor

John S. Martin.

Witnesses

*Edw. S. Duwall Jr.*  
*W. S. Duwall*

By his Attorneys.

*C. A. Snow & Co.*



# UNITED STATES PATENT OFFICE.

JOHN S. MARTIN, OF SNOHOMISH, WASHINGTON.

## MARINE PROPULSION.

SPECIFICATION forming part of Letters Patent No. 527,798, dated October 23, 1894.

Application filed January 2, 1894. Serial No. 495,407. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN S. MARTIN, a citizen of the United States, residing at Snohomish, in the county of Snohomish and State of Washington, have invented a new and useful Improvement in Marine Propulsion, of which the following is a specification.

My invention relates to marine propulsion and has particular reference to that class thereof operated by hand and designed for propelling small boats.

The objects of my invention are to provide a very simple construction or mechanical arrangement for propelling small boats, which mechanism or arrangement may be operated by a person facing the bow of the boat; which may be designed for one or several persons in accordance with the length of the boat, which will gain a maximum amount of power with a minimum amount of labor and which will be compact and out of the way within and below the upper edge of the boat, so as not to annoy or inconvenience the occupants of the boat.

With these and various other objects in view, my invention consists in certain features of construction hereinafter specified and particularly pointed out in the claims.

Referring to the drawings:—Figure 1 is a perspective view of a boat embodying my invention. Fig. 2 is a longitudinal sectional view of the same.

Like numerals of reference indicate like parts in both the figures of the drawings.

The numeral 1 designates the hull of any suitable boat, the same being provided with the usual seats 2. Adjacent to the stern of the boat I arrange a cross-timber 3, and secure to said timber and to the stern-wall of the boat a pair of rearwardly disposed parallel beams 4. These beams 4 support a hood 5 and also a pair of transversely opposite bearings 6 in which is arranged the paddle-shaft 7 having a series of radial paddles 8. The ends of the paddle-shaft project beyond the bearings and are provided with cranks 9, which are disposed at any angle to each other so as to overcome dead centers.

To the beams 4, between the stern wall and cross-timber 3 I secure slotted bearing-blocks 10, and fulcrum within the slots upon bearing-bolts 11, levers 12. These levers 12, as

will be seen, are fulcrumed at an intermediate point, and extend above and below the beams 4.

A pair of pitman-rods 13 are loosely connected with the cranks 9 of the paddle-shaft at opposite sides of the hood 5, and at their forward ends are slotted at 14 and provided with pairs of perforations 15, through any pair of which transverse connecting-bolts 16 are passed, the said bolts likewise passing through perforations formed in the upper ends of the short levers 12.

Upon suitable cross-timbers in the bottom of the boat and in front of each of the seats I locate bearing-blocks 15<sup>a</sup>, the same having slots formed therein to receive the lower ends of a pair of operating levers 16<sup>a</sup>, which are pivoted by bolts 17 within said slots. These levers extend upward in front of the seat to be occupied by the operator and above their lower pivoted ends are provided with slots 18 to receive the front ends of connecting-bars 19, whose rear ends are provided with slots that receive the lower ends of the short levers 12, and are pivotally connected thereto by transverse bolts 21.

It will be seen that a person occupying the seat and grasping the levers 16<sup>a</sup>, may, by vibrating the same in opposite directions, cause a rotation of the paddle-shaft together with the paddle-wheel and thus propel the boat in either direction. I may arrange double sets of levers 16<sup>a</sup> in front of the several seats of a boat, and connect said levers by intermediate bars in a manner that is obvious and too well understood to require illustration.

If preferred, the levers 16<sup>a</sup> may be operated by two persons instead of one, which I accomplish by arranging upon the upper ends of said levers cross-heads 21, at whose ends vertical handles 22 are located. When thus arranged, said levers may be operated by two operators who face each other, one facing the bow and the other the stern.

The rudder 23<sup>a</sup> is arranged on the stern-post of the boat, and through proper tiller-ropes 23 passing through suitable guides, to be operated by the feet of the operator, for whose accommodation I locate the tiller-bar 24 upon a pivot 25 in front of the seat 2.

By my invention, it will be seen that I am enabled to propel a boat with ease to the op-

erator, and yet, at the same time multiply or increase the power expended, the same resulting in a maximum speed of rotation of the propeller of the boat. By arranging the mechanism so that the operator faces the bow, many disadvantages are overcome and advantages secured. The operator will be enabled to see all obstructions that may lie in his path, as well as to take advantage of any currents, which exist in many streams, which will greatly facilitate his progress. By the employment of the levers 12, it will be seen that the working mechanism is all below the seats and cannot in any way inconvenience the occupants of the boat, nor obstruct their ingress or egress.

The number of operating-levers 16<sup>a</sup> and connecting-rods may be duplicated to suit the requirements and the size of the boat.

20 Having described my invention, what I claim is—

1. The combination with the hull of a boat, of bearings arranged in the rear of the stern, a paddle-shaft having cranks, and the paddle-wheel journaled in the bearings, a pair of operating levers fulcrumed at their lower ends in front of a seat of the boat, a pair of vertical levers fulcrumed in rear of the seat, pitman-rods between the upper ends of the vertical levers and the cranks of the shaft, and connecting-bars between intermediate points of the operating-levers and the lower ends of the vertical levers, substantially as specified.

2. The combination with the hull of a boat, the cross-timber, the rearwardly disposed parallel beams having bearings, the paddle-shaft arranged in the bearings and having cranks at its outer ends, the paddle-wheel arranged upon the shaft, of the slotted blocks secured to the sides of the beams, the short vertical levers intermediately fulcrumed in the slot-

ted blocks, the pitman-rods loosely connected at their rear ends to the cranks of the shaft and at their front ends slotted and pivotally and adjustably connected with the upper ends of the short levers, the slotted bearing-blocks in front of the seat, the levers pivoted at their lower ends in bearing-blocks, said levers above their points of pivot having slots, and the rods pivoted in the slots of the levers and at their rear ends provided with slots in which are pivoted the lower ends of the vertical levers, substantially as specified.

3. The combination with the hull of a boat, the cross-timber, the rearwardly disposed parallel beams having bearings, the paddle-shaft arranged in the bearings and having cranks at its ends, the paddle-wheel arranged upon the shaft, of the slotted blocks secured to the sides of the beams, the short vertical levers intermediately fulcrumed in the slotted blocks, the pitman-rods loosely connected at their rear ends to the cranks of the shaft and at their front ends slotted and pivotally and adjustably connected with the upper ends of the short levers, the slotted bearing-blocks in front of the seat, the levers pivoted at their lower ends in the bearing-blocks, said levers above their points of pivot having slots, and the rods pivoted in the slots of the levers and at their rear ends provided with slots in which are pivoted the lower ends of the vertical levers, the cross-heads at the upper ends of the operating levers, and the pairs of handles on the cross-heads, substantially as specified.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN S. MARTIN.

Witnesses:

C. W. SIGLAR,  
JOHN F. ELDRED.



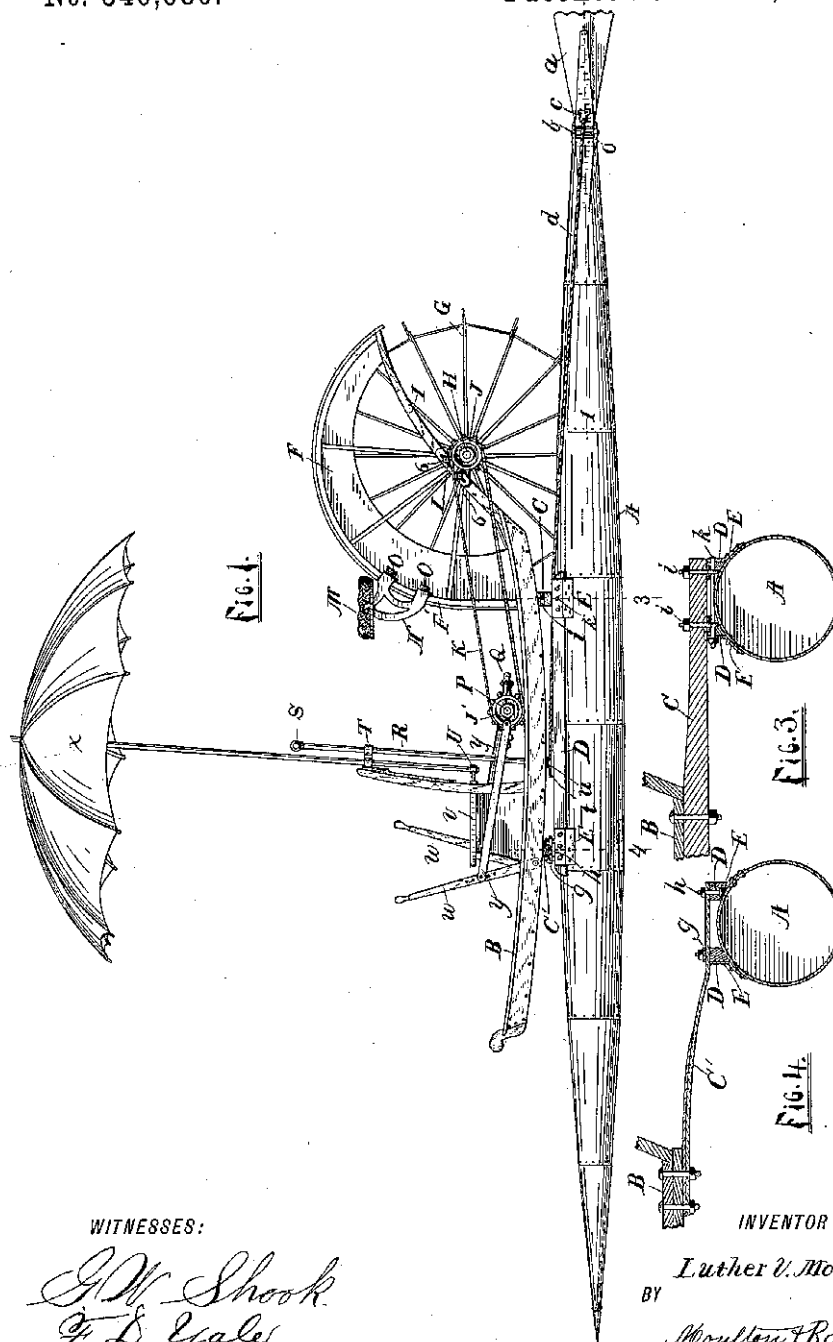
(No Model.)

2 Sheets—Sheet 1.

L. V. MOULTON.  
MARINE VELOCIPEDE.

No. 540,680.

Patented June 11, 1895.



WITNESSES:

*G. W. Shook*  
*F. D. Yale*

INVENTOR

*Luther V. Moulton.*  
BY  
*Moulton & Rogers,*  
ATTORNEYS.

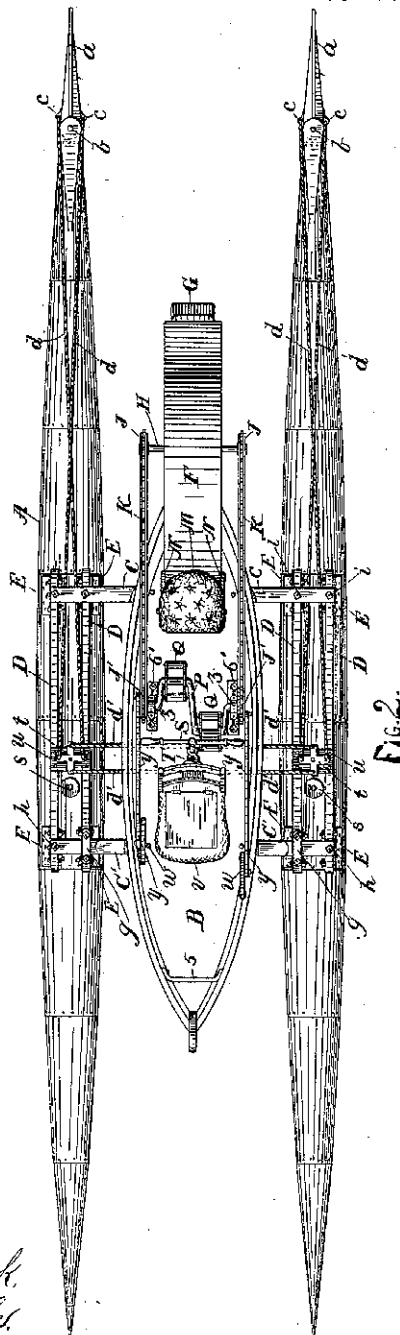
(No Model.)

2 Sheets—Sheet 2.

L. V. MOULTON.  
MARINE VELOCIPEDE.

No. 540,680.

Patented June 11, 1895.



WITNESSES:

*G. W. Shook*  
*F. D. Gale*

INVENTOR

*Luther V. Moulton*,

BY

*Moulton & Rogers*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

LUTHER V. MOULTON, OF GRAND RAPIDS, MICHIGAN.

## MARINE VELOCIPEDÉ.

SPECIFICATION forming part of Letters Patent No. 540,680, dated June 11, 1895.

Application filed November 11, 1889. Serial No. 329,969. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER V. MOULTON, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Marine Velocipedes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in marine velocipedes, and its object is to provide the same with certain new and useful features hereinafter fully described and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a detail view showing the manner of attaching the connecting-beam to the floats; Fig. 4, the same of the forward connecting-springs.

Like letters and numerals refer to like parts in all of the figures.

A A represent two substantially cigar-shaped floats, arranged a suitable distance apart and parallel with each other, and preferably made of galvanized iron riveted and soldered, which floats constitute the boat proper. These floats support a body B having any convenient shape; that shown being of a small flat bottomed skiff. This body B is supported above the water and between the floats A A, and connected to the same by flexible bearings, consisting of the beam C and springs C', which beam and springs are secured to said body by suitable bolts or other fastenings; and at their outer ends to parallel sills D, which sills are secured to the floats A A by angle plates, E. The beam C is pivoted to said sills by eye bolts *i i* and the bolts *k*, the latter passing through said eye bolts and sills, as shown; or said beams may be rigidly secured to the sills by bolts, or otherwise, and provided with sufficient torsional flexibility to permit the desired movement of the floats in a sea-way; or spring bearings may be used all around, but I prefer the construction shown. The springs C' are secured to the

outer sills by bolts *h*, and to the inner sills by clips *g*.

F is a suitable wheel-house at the rear of the body B, having forward and upper curved bars F' and rear inclined bars I. The paddle wheel G rotates within the wheel-house and is mounted on a shaft H which rotates in bearings L secured to the bars I by bolts 6—6 passing through elongated openings in said bearings, whereby the latter are longitudinally adjustable on said bars to adjust the paddle wheel relative to the water. Said shaft H is provided with sprocket wheels J, which are connected by chain K with similar sprocket wheels J' on the respective ends of a double crank shaft, which is provided with pedals Q and journaled in hangers *z z* adjustably secured to the floor of the body B by bolts 6 passing through elongated openings in said hangers. In the sprocket wheels J' and in the plane of the pedals Q are crank pins, on which are journaled connecting rods *y* which extend diagonally forward and upward at each side of a seat *v* and are pivoted at their forward ends to levers *w w*, which levers are pivoted near the floor of the body B and properly located to be operated by a person upon the seat *v*. One chain K and the connected wheels may be omitted, but I prefer two as shown, thus reducing torsional strains upon the shafts, P and H, and in case one side should be disabled the other will continue to operate.

M is a seat, pivoted to and supported by brackets N adjustably secured to the forward side of the wheel-house, being movably secured to the bars F' by set screws O O.

A rudder of suitable form is pivoted at *b* to the rear end of each float, and said rudders are operated by suitable wires *d* which are attached to eyes *c c* at each side of the rudders and extend forward along the surface of the floats to the transverse arms of the crosses *t*, which crosses are pivoted to plates *u* secured to the sills D. Other cords or wires *d'* extend inward from the longitudinal arms of said crosses, and at their inner ends are attached to the respective arms of a T-head (not shown) on the lower end of a steering post R journaled near its upper end in a bracket T attached to the back of a seat *v* and journaled

near its lower end in the floor of the body B, and also provided with a suitable handle S at the upper end.

A staff to support an umbrella, flag, or sail, passes through an opening in the bracket T and rests at its lower end in a socket U secured to the seat v.

ss are removable caps which close openings through which access may be had to the interior of the floats.

The device shown is adapted to be operated by two persons. One upon the seat v, operates the levers w w by the hands, and the other, upon the seat M, operates the crank shaft P with the feet on the pedals Q and with the hands steers the device by means of the handles S and parts connecting the same with the rudders.

It will be observed that the direction of the thrust on the pedals on the shaft P, by the operator on the rear seat M, is substantially at right angles to the thrust of the connecting rods y, actuated by the operator on the front seat v. This is of great advantage in maintaining a substantially steady action on the connecting chains K and paddle wheel G, as when the crank shaft P is on the quarter and inoperative, the front levers w are at the quarter and fully effective, and vice versa, and as the power of one decreases the other increases, thus effectually avoiding any periodical impulses of power applied to the wheel G, which would cause it to slip when the power is at the maximum and be inefficient at the intermediate dead points.

By utilizing the back of the chair for supporting the steering post and staff, and the front of the wheel-house for supporting the rear seat, I avoid the expense and complications incident to employing special parts for such purposes. By making the floor hangers adjustable I am able to adjust the wheel bearings diagonally along the bar I and thus make the structure simple and effective in adjusting the wheel to the water and in maintaining the chains in proper tension. By providing flexible connections between the floats, each float is permitted to rise and fall independently in the sea-way, and thus enabled to pass through the water more easily and caused to not plunge below the crest of the wave as far as they would if rigidly attached. These are all important advantages possessed by my invention over marine velocipedes heretofore proposed.

I do not claim herein the steering mechanism shown and described as it has been made the subject of a separate application filed by me May 6, 1893, and serially numbered 473,319; but

What I do claim is—

1. The combination of two parallel floats, a body between said floats, having propelling mechanism attached, a beam supporting one end of said body and pivoted to said floats, and springs supporting the other end of said

body and attached to said floats, substantially as described.

2. The combination of two parallel floats, a body between said floats having propelling mechanism attached, a beam supporting the rear end of said body and connecting said floats, and springs connecting said floats to the forward end of said body and supporting the latter, said springs operating to permit independent vertical movement of the forward ends of said floats, substantially as described.

3. In combination, parallel floats, a body between the same having propelling mechanism attached, a beam attached to said body and secured to said floats by inner and outer eye-bolts and bolts through the same, and springs attached to said body and secured to said floats by bolts and clips, substantially as described.

4. The combination of two parallel cylindrical floats having sills attached by angle plates, and a body supported upon a beam connecting said floats and pivoted to said sills, and springs attached to said body and to said sills, substantially as described.

5. The combination with a boat having a rear wheel house, and a paddle wheel, mounted on a shaft journaled in said wheel house, a double crank shaft in front of said wheel house, sprocket wheels on the ends of each of said shafts, chains connecting said sprocket wheels, brackets adjustably secured to said wheel house and wholly supported thereby, and a seat pivoted to said brackets, substantially as described.

6. In a propelling mechanism for boats, the combination of a propelling wheel, a double crank shaft connected to said wheel and provided with pedals, pivoted hand levers, and rods connecting said hand levers to said crank shaft and acting upon said shaft at substantially right angles to the action of said pedals, whereby the dead centers of the cranks and the dead centers of the connecting rods are substantially at right angles with each other, substantially as described.

7. The combination with a boat having a rear wheel house, and a paddle wheel mounted on a shaft journaled therein, of a double crank shaft, provided with pedals and located in front of said wheel house, sprocket wheels on the respective ends of said shafts, chains connecting said sprocket wheels, crank pins in the sprocket wheels on the crank shaft, said pins being located in the plane of the cranks, connecting rods extending diagonally forward and upward from said crank pins, and pivoted levers to which said rods are connected, substantially as described.

8. The combination of two parallel cigar-shaped floats, connected by flexible bearings upon which are supported a body having a paddle wheel at the rear, a wheel house over said wheel, a seat attached to the front of said wheel house, a double crank shaft connected

to said wheel by mechanism for transmitting motion, a seat in front of said crank shaft, pivoted levers at each side of said seat, connecting rods pivoted to said levers and crank shaft, a suitable steering post attached to said forward seat, and cords or wires extending from said post to rudders, substantially as described.

9. The combination of a body supported upon parallel floats, a wheel house at the rear of said body, having a paddle wheel journaled in adjustable bearings at its rear end, and an adjustable seat at its front side, a double crank shaft journaled in adjustable bearings on the floor of said body, and pro-

vided with sprocket wheels and chains to transmit motion to said paddle wheel, connecting rods pivoted to said sprocket wheels and to levers pivoted to said body, a seat between said connecting rods, having a back supporting an umbrella, and a rotatable steering post having wires attached, said wires extending to and operating rudders on said floats, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

LUTHER V. MOULTON.

Witnesses:

DENNIS L. ROGERS,  
GEORGE W. SHOOK.



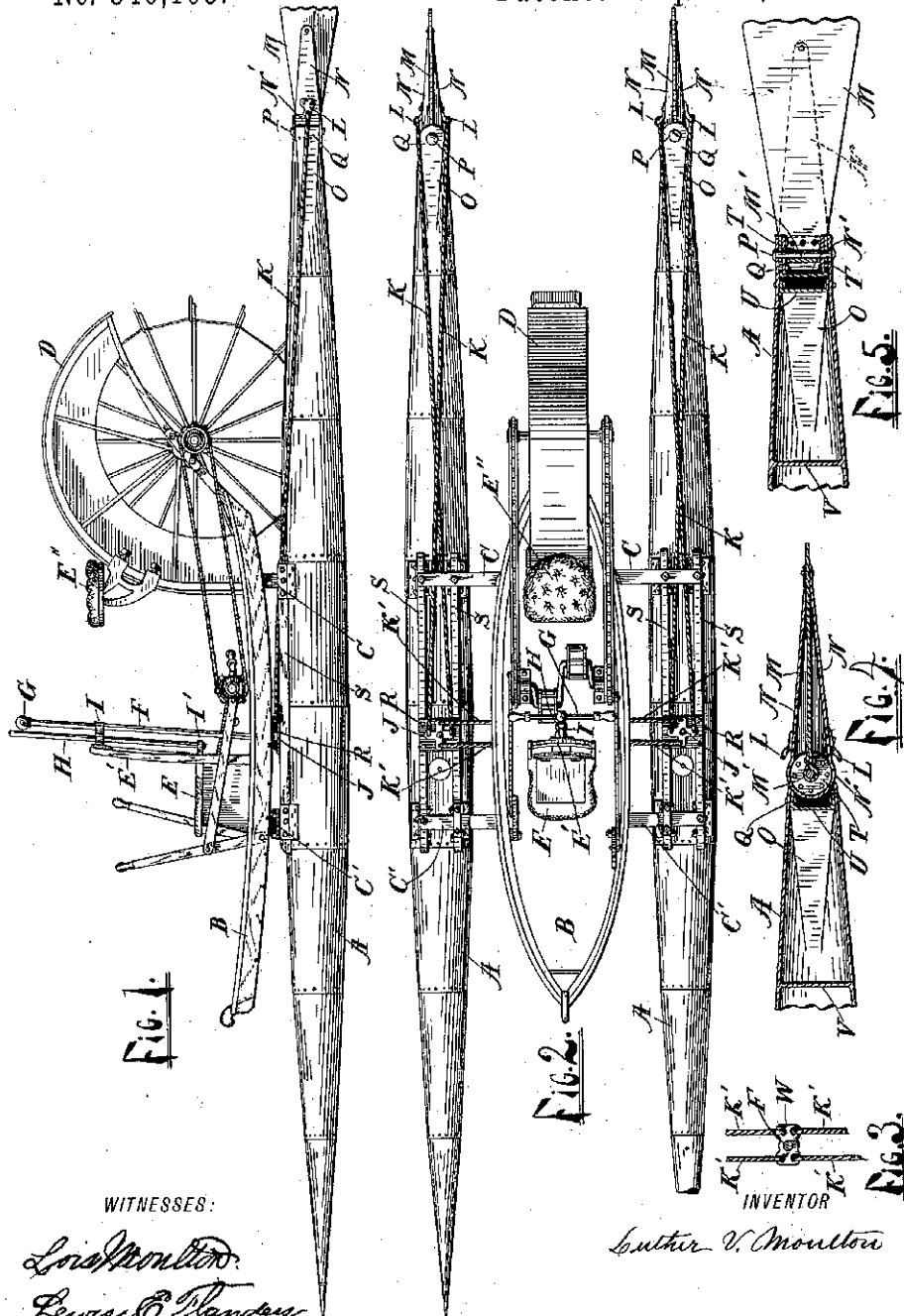


(No Model.)

L. V. MOULTON.  
MARINE VELOCIPEDE.

No. 546,105.

Patented Sept. 10, 1895.



WITNESSES:

Louis Moulton  
Lewis C. Planderson

Luther V. Moulton

# UNITED STATES PATENT OFFICE.

LUTHER V. MOULTON, OF GRAND RAPIDS, MICHIGAN.

## MARINE VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 546,105, dated September 10, 1895.

Application filed May 6, 1893. Serial No. 478,819. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER V. MOULTON, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Marine Velocipedes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in marine velocipedes, and its object is to provide the same with certain new and useful features, hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention; Fig. 2, a plan view of the same; Fig. 3, a detail, showing a plan view of the T-head at the lower end of the steering-post; Fig. 4, a detail of the rudder in horizontal section in the plane of the axis of the cylinder; Fig. 5, the same in vertical section in the same plane.

Like letters refer to like parts in all of the views.

A A are two cigar-shaped cylinders or floats arranged parallel to each other, and a short distance apart, between these and above the water, is the body B, supported at the rear by beams C and at the front by the spring C', which beams and spring are attached at their outer ends to the sills S S secured to the respective floats A. At the rear of the body B is a wheel-house D for the propelling-wheel, upon which is mounted an adjustable seat E'', and at a suitable distance forward of said seat is another chair-shaped seat E, having a back E', to the upper part of which is attached a bracket I, having two vertical openings, in one of which openings is placed the staff or post H, the lower end of which rests in the lower bracket I', and upon the upper end of which staff may be fixed an umbrella, flag, or other convenient device, at pleasure. In the other opening of the bracket I is journaled the steering-post F, having transverse handles G at the top. Said post is journaled near its lower end in the floor of the body and passing through the same terminates in a T-

head W, to the respective ends of which head are attached two cables or wires K', which cables extend laterally in opposite directions and are attached to the corresponding ends of the longitudinal arms of the crosses J, so that all three vibrate in unison about their respective axes in a horizontal plane when turned by the handles G. Said crosses J are pivoted upon plates R, secured to the sills S, and the transverse arms of said crosses are connected to the eyes L, at the respective sides of the rudders M, by means of cables or wires K, by which means the rudders are simultaneously turned from side to side, as the crosses J are turned by means of the handles G, as before described.

To symmetrically prolong the taper of the floats A so they may run easily, also to afford a strong joint between the rudder and body of the float, and to afford a suitable point of attachment for the cables K, so that they will run close to the floats, I flatten the top, bottom, and sides of the floats A, as shown at O, terminating the same in a rectangular end Q, within which is a rectangular diaphragm U, thus forming a box-shaped chamber at the end open rearwardly, with its horizontal sides prolonged beyond its vertical sides, to the former of which is pivoted the rudder by a suitable pintle P, around which the forward part M' of the rudder is turned and riveted. Said forward end of the rudder is also provided with a head N', having the form of about two-thirds of a cylinder, with its axis coinciding with the pintle P, and having a vertical cross-section adapted to close the box-shaped rear end Q, and having its forward portion within the same. This cylindrical head is formed of disks T T at each end and the curved portion of a plate N', which plate is bent and secured to said disks, and also prolonged rearward at each side of the rudder, forming tapered chambers N N, which are rectangular in cross-section, and which serve to prolong the lines of the float A to a point, and at the same time provide a suitable point of attachment and suitable leverage for the rear ends of the cables K K, and also to brace and strengthen the blade M of the rudder. Said floats are also strengthened by a suitable number of transverse partitions V, as occasion requires. It will be observed that the

cables K run in contact with the surface of the floats and are attached to slightly-projecting rounded eyes at each side of the rudder-heads, and that no cables or other connections extend from side to side behind the wheel. Thus, there are no obstructions to become clogged with vegetable or other floating matter, and a serious disadvantageous feature of other marine velocipedes is, therefore, overcome. It is evident that this form of steering mechanism is applicable to any boat having a stern wheel and two rudders, (one rudder at each side,) and I therefore do not limit myself to its use in conjunction with two parallel floats.

I do not claim herein the construction of boat and propelling mechanism shown and described, as the same is made the subject of a separate application filed by me November 11, 1889, Serial No. 329,969; but

What I do claim is—

1. The combination with parallel floats, of rudders pivoted to the same, a body supported between said floats, a post, journaled on said body and having a T-head, crosses pivoted on said floats, and cables or wires extending oppositely from said T-head to the respective crosses and rudders on each float, substantially as described.

2. The combination of two parallel floats having rudders with cylindrical heads, parallel sills on said floats, a body between said floats supported on said sills, a substantially vertical steering post journaled on said body and provided at its lower end with a T head and at its upper end with a handle, crosses journaled on plates attached to said sills, cables or wires extending oppositely from said T-head to the longitudinal arms of said crosses, and cables or wires extending from the transverse arms of the respective crosses to the sides of the respective rudders and in contact with said floats, substantially as described.

3. In a marine velocipede, a cylindrical float tapered rearwardly and flattened on four sides, and provided with a transverse diaphragm to form a rectangular chamber at the end of said float, and a rudder having a cylindrical head and pivoted to turn partially within said chamber, substantially as described.

4. In a marine velocipede, in combination with a substantially cylindrical, or cigar shaped float terminating in a box shaped end,

a rudder having a substantially semicylindrical head pivoted within said end and means for turning said rudder upon its pivot; and prolongations of said head forming tapered chambers at each side of said rudders, substantially as described.

5. In a marine velocipede, a substantially cigar shaped float terminating at the rear in a substantially square end, having projecting upper and lower sides, a cylindrical rudder head pivoted to said projecting sides, said head prolonged at each side of the rudder to strengthen the same and prolong the lines of the cylinder to a point and disks to close the ends of said rudder head, substantially as described.

6. The combination of two substantially cigar shaped floats, having bulk heads near the rear and terminating in box shaped ends, rudders having substantially cylindrical heads pivoted in said ends, cords or wires attached to the respective sides of said rudder heads, and extending forward and inward and attached to a T head on a steering post having handles, substantially as described.

7. The combination of two cigar shaped floats, terminating in box shaped rear ends, rudders having substantially semi-cylindrical heads pivoted within said ends, and prolonged at each side of said rudders, a body supported by and between said floats, a post journaled upon said body, a T head at the bottom, and handles at the top of the same, crosses pivoted upon said floats, and cords or wires extending from the respective sides of said rudders to said crosses and other wires or cords extending from said crosses to said T head, substantially as described.

8. The combination with a boat having a stern wheel, and a rudder at each side thereof, of a vertical steering post having a T head and a handle, crosses pivoted in the plane of said T head, and cables or wires oppositely extending from said T head to the longitudinal arms of said crosses, and cables or wires extending from the transverse arms of said crosses to the respective sides of said rudders, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LUTHER V. MOULTON.

Witnesses:

LOIS MOULTON,  
LEWIS E. FLANDERS.



(No Model.)

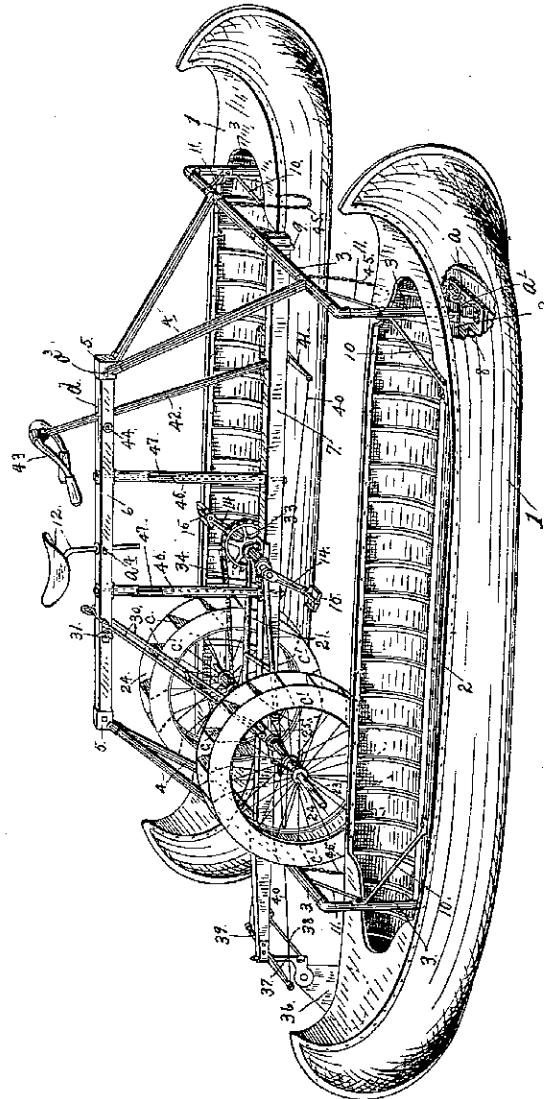
3 Sheets—Sheet 1.

R. L. BOULTER.  
BICYCLE BOAT.

No. 557,647.

Patented Apr. 7, 1896.

Fig. 1.



Witnesses

C. F. Kilgore  
J. D. Merchand,

By his Attorney.

Inventor

Royal L. Boulter

Jas. F. Williamson

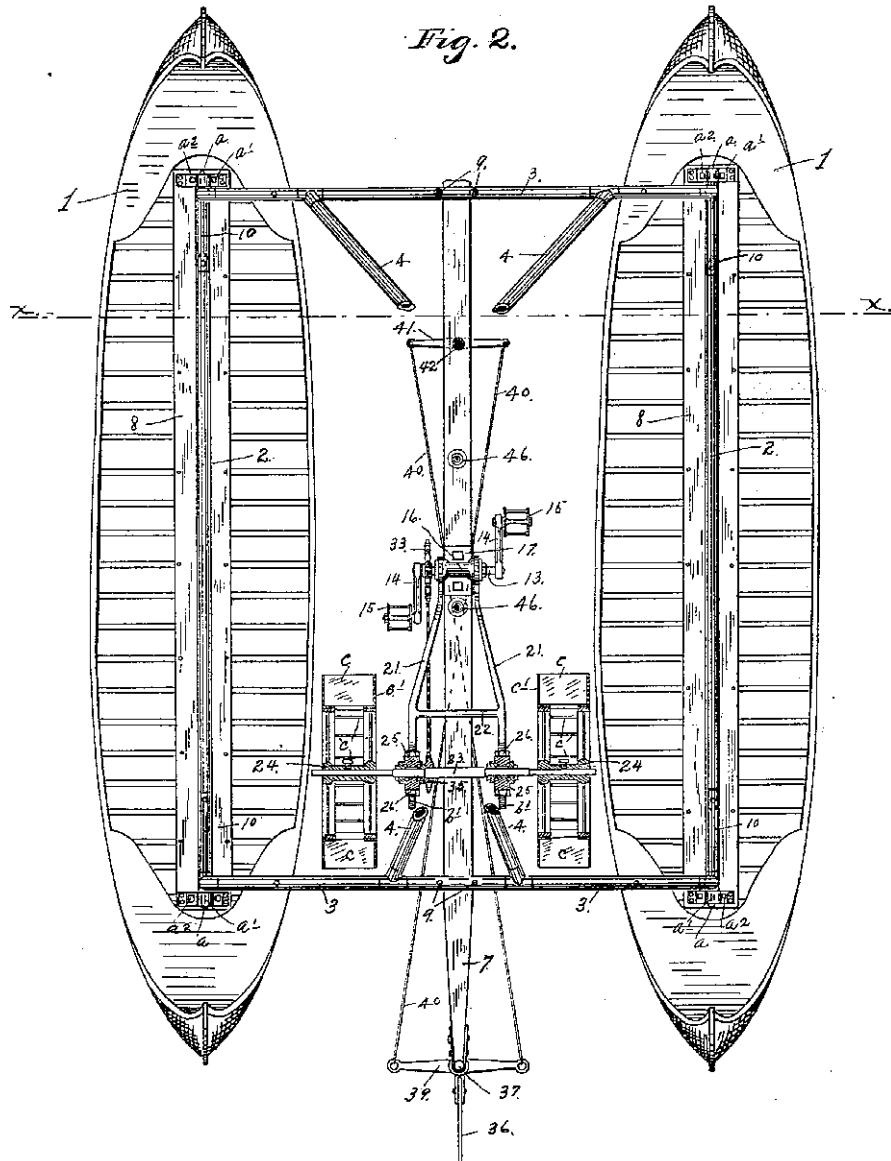
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3 Sheets—Sheet 2.

R. L. BOULTER.  
BICYCLE BOAT.

No. 557,647.

Patented Apr. 7, 1896.



Witnesses.  
C. F. Kilgore,  
J. D. Merchant.

Inventor:  
Royal L. Boulter  
By his Attorney,  
Jas. F. Williamson.

(No Model.)

3 Sheets—Sheet 3.

R. L. BOULTER.  
BICYCLE BOAT.

No. 557,647.

Patented Apr. 7, 1896.

Fig. 3.

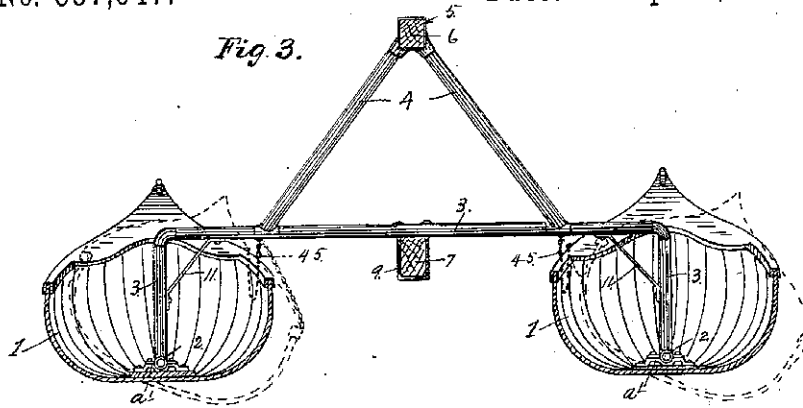


Fig. 5.

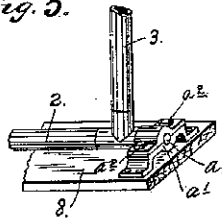


Fig. 4.

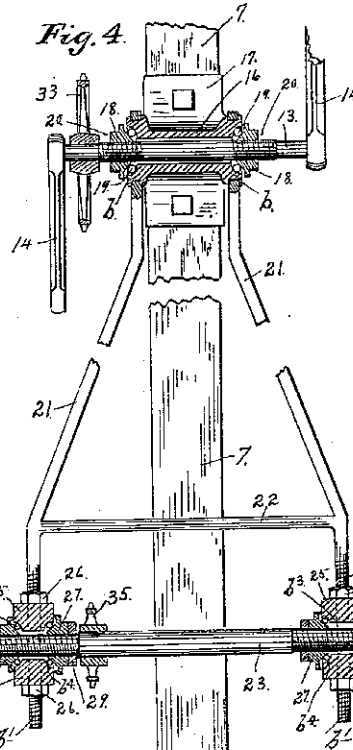
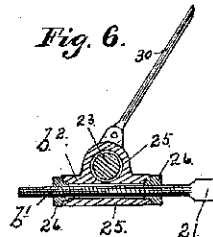


Fig. 6.



Witnesses.

C. F. Kellogg  
J. D. Merchant

By his Attorney.

Jas. F. Williamson.

Inventor.

Royal L. Boulter.



# UNITED STATES PATENT OFFICE.

ROYAL L. BOULTER, OF GRAND FORKS, NORTH DAKOTA.

## BICYCLE-BOAT.

SPECIFICATION forming part of Letters Patent No. 557,647, dated April 7, 1896.

Application filed September 21, 1895. Serial No. 563,164. (No model.)

*To all whom it may concern:*

Be it known that I, ROYAL L. BOULTER, a citizen of the United States, residing at Grand Forks, in the county of Grand Forks and State of North Dakota, have invented certain new and useful Improvements in Bicycle-Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved bicycle-boat.

To this end my invention consists of the novel features of construction hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein, like letters and numerals referring to like parts throughout the several views—

Figure 1 is a perspective view of my improved boat with some parts broken away. Fig. 2 is a plan view with some parts shown in horizontal section and others broken away. Fig. 3 is a vertical section on the line *x x* of Fig. 2, looking toward the front of the boat. Fig. 4 is a skeleton view, chiefly in section, in a plane through the crank-shaft and the paddle-shaft bearings, with some parts broken away and others removed. Fig. 5 is a detail showing connection of a frame to one of the boats; and Fig. 6 is a detail, partly in section, showing connection for adjusting the paddle-wheel shaft in respect to the frame.

The numeral 1 represents a pair of boats, which are preferably of the canoe type.

The numerals 2, 3, 4, 5, 6, and 7 represent the principal parts of the rigid or main frame. Of the said parts the members 2 are tubular pieces or rods arranged lengthwise of the boats 1 and secured to bed-pieces 8 in the bottoms of the said boats by means of trunnion-bearings *a*, fixed to the tubes, and boxes *a'*, which are fixed to the bed-pieces 8, as best shown in Figs. 1, 2, 3, and 5. The bed-pieces 8 are preferably made of wood and are fixed to the ribs of the boat-body. The lower halves of the boxes *a'* are permanently fixed to the bed-boards 8, and the upper halves of the said boxes are removably secured to the lower halves by screw-bolts *a''*, or in any other suitable way. The trunnion-pieces *a* are set

into the ends of the tubes 2 in any suitable way. The frame-pieces 3 are composed of tubular rods bent into yoke-like form, with their vertical sections extending downward into the boats and brazed fast to the bottom tubes 2, as shown, so as to be rigid therewith. The frame members 4 are composed of tubes which have their lower ends brazed fast to the horizontal sections of the yoke-like pieces 3 and converge to a junction with the cap 5 at their upper ends, to which caps the upper ends of the said tubes 4 are brazed or otherwise made rigid therewith. The caps 5 are hollow and serve to afford seats for the ends of the backbone or top piece 6, which is preferably composed of wood, and is secured to the caps 5 by bolts *a''*, or in any other suitable way. The frame member 7 is preferably a wooden bar extending centrally between the boats and supported by stirrups 9, fixed to the horizontal sections of the frame members 3. The said bar 7 may also be braced in any suitable way by means, (not shown,) in addition to the stirrups 9, for rendering the same perfectly rigid with the other parts of the main frame. The vertical sections of the yokes 3 are braced by diagonal stays 10, which connect the same to the bottom tubes 2, as best shown in Fig. 1. The horizontal and vertical sections are also braced by the stays 11, connecting the two sections near their corners, as best shown in Figs. 1 and 3.

With the construction above described it is obvious that the parts marked with the numerals 2 to 11, inclusive, constitute a rigid frame, which is supported by the boats 1, and to which frame the said boats 1 are independently pivoted by the parts *a a'*, with freedom for lateral rocking motion, in respect to the frame.

It must be noted that the pivotal connections between the boats and the frame supported thereby are made at points below the centers of buoyancy of the said boats. This feature of construction is of the utmost importance, as in virtue of the same, the weight from the frame being thereby applied to said boats below their said centers of buoyancy, said boats will under the action of their own buoyancy seek and tend to remain in upright positions. In case the boats were pivoted to the frame at points above their centers of

buoyancy it would require auxiliary devices to prevent said boats from turning upside down. It is also obvious that by the removal of the upper halves of the boxes *a'* the frame 5 and the boats may be readily separated at will.

On the backbone or upper frame-bar 6 is adjustably mounted a rider's seat 12, which is securable in any desired vertical adjustment by clamping-screw *a'*. On the lower 10 bar 7, in proper position in respect to the seat 12, is properly mounted the crank-shaft 13 with crank-arms 14, which have pedals 15 at their outer ends. The bearings for the said crank-shaft are afforded by the yoke or fixed 15 sleeve member 16, cast integral with the plate 17, which is bolted to the frame-piece 7. The said sleeve-casting 16 is provided with concave flanged ends, as shown at *b*, which serve as the cups for coöperation with the cones 18 20 to hold the ball-bearings 19. The cones 18 have screw-threaded engagement with the crank-shaft 13 for effecting their proper adjustments in respect to the cups and are held wherever set by jam-nuts 20.

The peripheries of the cup-flanges *b* on the sleeve-casting 16 are grooved, and in the same, as seats, are mounted the strap or yoke ends of a pair of radius bars or rods 21, which are 30 connected by a cross-bar 22 and carry at their outer ends the paddle-wheel shaft 23, having fixed to its opposite ends the paddle-wheels 24. The outer ends of the radius-bars 21 are screw-threaded, as shown at *b'*, and pass through enlarged holes *b''* in a bearing-casting 25. On the said screw-threaded portion *b'* of 35 said radius-bars work shouldered or stepped nuts 26, the stepped or reduced portions of which engage in the ends of the passage *b''* and clamp the radius-bars to the casting 25 while 40 spacing the radius-bar apart from the walls

sired position thereon by means of set-screws 32, which adjustment of the paddle-wheels enables them to be so set on the shaft 23 as 70 to make the boats run true under the propelling action thereon.

In respect to the details of the paddle-wheels 24, it is probably sufficient to note that the paddles or blade *c* thereof are so set in the 75 paddle-wheel rims *c'* that they will not carry the water back upward under the movement of the wheel.

On the crank-shaft 13 is fixed a sprocket-wheel 33, connected by chain 34 with a rela- 80 tively small sprocket-wheel 35 on the paddle-wheel shaft 23. Hence under the pedaling action the paddle-wheel shaft will be turned in the same direction as the crank-shaft and will impart the same motion to the 85 paddle-wheels 24.

The rudder-blade 36 is pivoted to the rudder head or shaft 37, which is mounted in the rear end of the bar 7, and a bearing-brace 38 secured thereto. The cross-arms 39 of the 90 rudder are connected by cross-wires or other flexible connections 40 to the cross-bar or lower arms 41 of a steering-shaft 42, which is journaled in the lower frame-bar 7 and extends upward through a slot *d* in the upper 95 frame-bar 6 and is provided at its upper end with handle-bars 43. A cross-bolt 44, extending through the slotted part of the top frame-bar 6, serves as a means to set the steering-shaft under sufficient friction, so as 100 to remain wherever set. With this arrangement of the steering mechanism, it is obvious that the rider can operate the rudder by manipulating the handle-bar 43 in the same way as the handle-bar of an ordinary bicycle. 105

The boats 1 are connected by chains 45 with the horizontal sections of the yoke-pieces

will be moved forward, and may be steered in any desired direction by the proper manipulation of the rudder through the handle-bar 43 and its connections. The rudder, however, will not require constant attention, inasmuch as the shaft 42 will be held by the clamping action of the bolt 44 in whatever position it may be set. The fact that the rudder-blade 36 is pivoted to the rudder-head 37 permits the said blade to rise when meeting an obstruction, thereby adapting the same for action in shallow water.

The pivotal connections of the boats to the main or rigid frame, for permitting the lateral rocking motion, is an important feature, inasmuch as it enables the boats to adapt themselves to the action of the waves with little or no tilting motion of the main frame.

The relative arrangement of the screw-threaded ends of the radius-bars 21 to the bearing-castings 25 and the stepped nuts 26 is an important feature, inasmuch as this construction affords a convenient means for adjusting the paddle-wheel shaft 23 in respect to the radius-bars 21, and thereby affords a means of tightening or loosening the sprocket-chain 34.

The ball-bearings for the crank-shaft and the paddle-wheel shaft render the driving-shaft comparatively free from friction, and therefore comparatively easy to the operator for any given load.

By actual experience with this form of boat I have found that one person can readily propel the machine, when loaded with four persons in the boats besides the rider on the frame, at the rate of eight miles per hour in still water. Otherwise stated, a much larger load can be carried at a much higher speed than when the boats are manipulated by oars, and this machine is also much safer than an ordinary boat, because it is much less liable to be overturned by the waves.

The machine is also comparatively cheap to make and has an artistic appearance.

Having regard to the main or rigid frame of the machine, I preferably add to the main parts thereof, hitherto noted, additional parts consisting of the spacing gas pipes or spools 46 and tie-rods 47, for spacing apart and rigidly connecting the upper and lower frame-beams 6 and 7, as shown in Fig. 1 of the drawings. By the addition of the said spacing-spools 46 and said tie-rods 47 the said beams 6 and 7 are not only spaced apart and tied together, but are rendered rigid with each other and reinforced for withstanding the weight of the rider and the downward thrust on the crank-shaft under the pedaling action. This same result might, of course, be accomplished by braces otherwise constructed and arranged with respect to the said upper and lower frame-beams 6 and 7; but the said spools 46 and tie-rods 47 afford convenient devices for the purposes had in view.

In practice the main or rigid frame would

preferably be made of wood, so as to have no sinkable material about the boat. The braces 46 would also, preferably, be arranged diagonally sloping upward and outward from the lower beam 7 to a junction with the upper beam 6, and the tie-rods 47 would retain vertical positions, but be independent of the braces 46. This would make all parts of the frame coöperate with a trussing action.

It will be understood, of course, that many of the details of the construction of the machine herein shown and described might be changed without departing from the spirit of my invention.

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

1. The combination with a bicycle-like frame and drive, of a pair of boats supporting and pivoted to said frame at points below the centers of buoyancy of said boats, and one or more paddle-wheels carried by said frame and operated through said drive, substantially as described.

2. The combination with a bicycle-like frame and drive, of a pair of boats supporting and pivoted to said frame at points below the centers of buoyancy of said boats, one or more paddle-wheels carried by said frame and operated through said drive, and a rudder on said frame with steering connections involving a handle-bar within reach of the rider on said frame, substantially as described.

3. The combination with a pair of boats, of a frame to which said boats are attached, a rider's seat and a pedal-action crank-shaft mounted on said frame, radius-bars pivoted on the fixed bearing box or yoke for the crank-shaft, a pair of paddle-wheels on a common shaft mounted in the outer ends of said radius-bars, and a hanger depending from the frame for suspending the outer ends of said radius-bars and the paddle-wheels at any desired height, substantially as described.

4. In the machine substantially as described, the combination with the crank-shaft, paddle-wheel shaft and sprocket and chain drive, of the radius-bars 21 having their inner ends pivoted on the fixed bearing-yoke of the crank-shaft, and having screw-threaded portions at their outer ends, of the castings 25 with radius-rod passages  $b^2$  and paddle-wheel shaft  $b^3$ , at right angles to each other, and the nuts 26 working on the screw-threaded portions of said radius-bars against the opposite ends of the said casting 25, for adjustably connecting the said radius-bars and paddle-wheel shaft, whereby the chain may be tightened or loosened at will, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROYAL L. BOULTER.

Witnesses:

LEWIS FOSTER,

WINTHROP B. BOULTER.

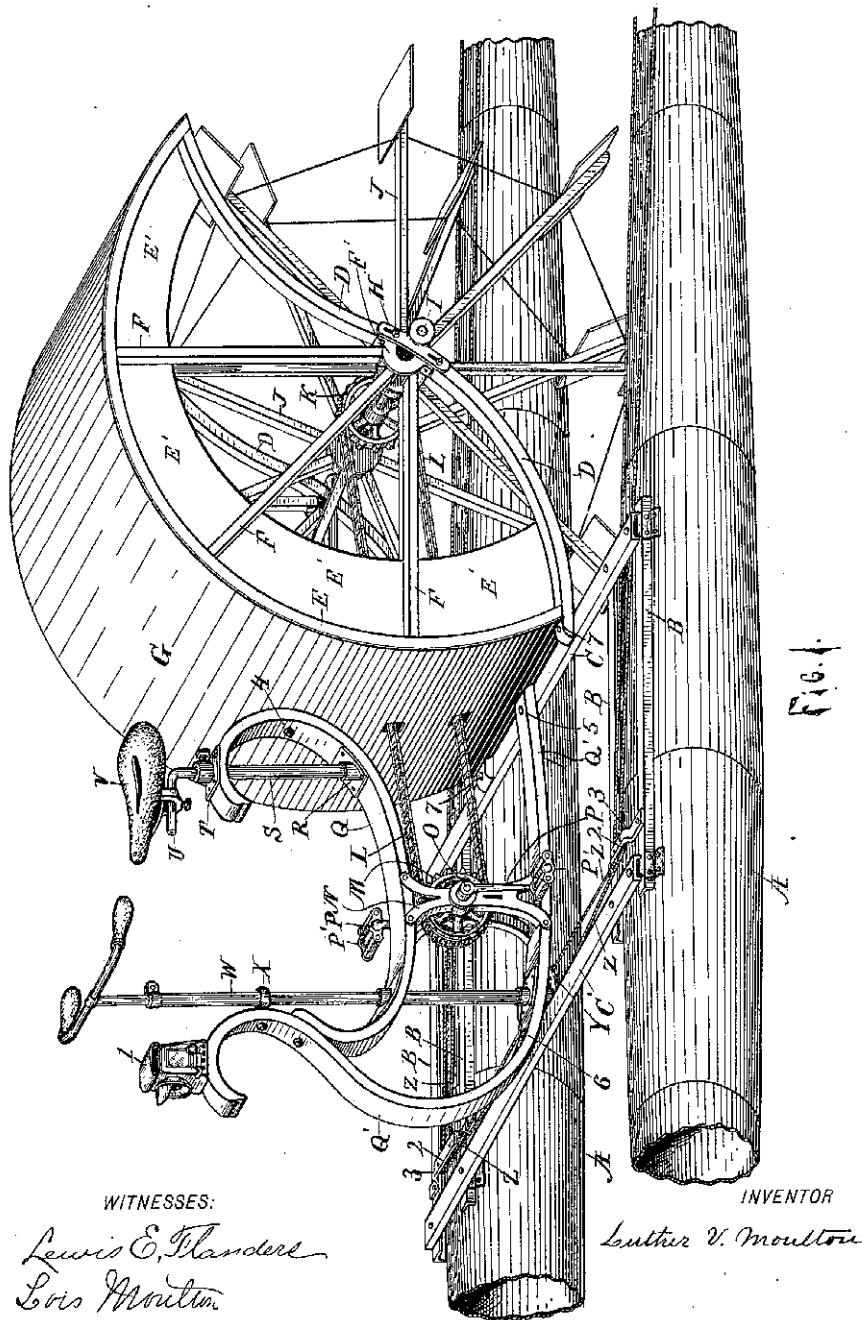
(No Model.)

2 Sheets—Sheet 1.

L. V. MOULTON.  
MARINE VELOCIPEDE.

No. 582,666.

Patented May 18, 1897.



WITNESSES:

*Lewis E. Flanders*  
*Lois Moulton*

INVENTOR

*Luther V. Moulton*

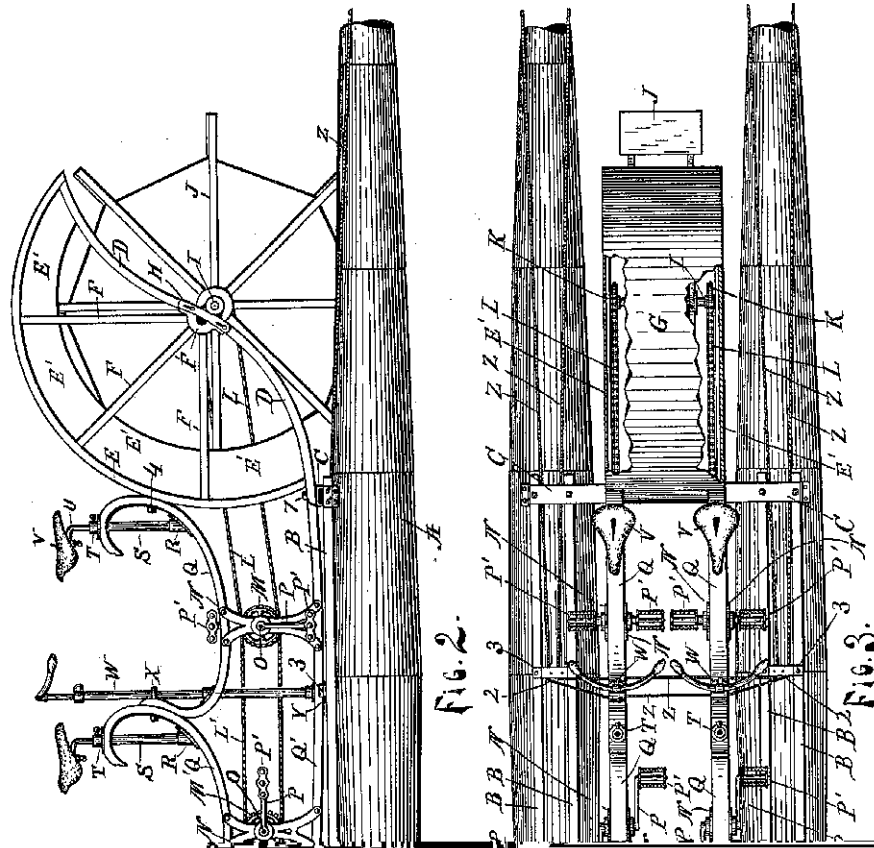
(No Model.)

2 Sheets—Sheet 2.

L. V. MOULTON.  
MARINE VELOCIPEDE.

No. 582,666.

Patented May 18, 1897.



# UNITED STATES PATENT OFFICE.

LUTHER V. MOULTON, OF GRAND RAPIDS, MICHIGAN.

## MARINE VELOCIPED.

SPECIFICATION forming part of Letters Patent No. 582,666, dated May 18, 1897.

Application filed January 30, 1896. Serial No. 577,481. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER V. MOULTON, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Marine Velocipedes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in marine velocipedes, and more particularly to the wheel-house and frame for the same; and its object is to provide the same with certain new and useful features, as hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is an isometric perspective of a device embodying my invention; Fig. 2, a side elevation of a modification thereof, and Fig. 3 a plan view of the same.

Like letters and numerals refer to like parts in all of the figures.

A A are two parallel floats of any suitable construction provided with parallel angle-bars B and connected by suitable beams C C'. The sills D D of the wheel-house are secured at their forward ends to the rear beam C by bolts 7 and are oppositely bent or curved at their respective ends, whereby they are substantially horizontal where they engage said beam and suitably inclined at the middle where the adjustable journal-bearings H are attached, and rearwardly extended at their upper ends to suitably cover the wheel. Attached to the upper side of said sills D are segmental bars E, concentric with the axis of the bearings H, and extending from said bars at intervals are radial braces F, secured to the said bars E at one end and to socket-castings F', attached to the sills D, opposite the bearings H.

E' are segmental panels extending inward from the bars E, and G is a curved plate attached to said bars, which plate and panels serve to close in the upper part of the wheel-house.

The paddle-wheels J J are mounted on a shaft I, journaled in the adjustable bearings H and driven by a sprocket-wheel K, actuated

by a chain L, extending from said sprocket-wheel to a similar wheel M on a shaft O, provided with cranks P and pedals P' at its respective ends.

To suitably support in place the various parts as hereinafter described, I provide a frame consisting of an upper bar Q, a lower bar Q', and hangers N. Said lower bar is attached at its rear end to the rear sill C by a bolt 5, and extending forward in a downward curve rests on the forward sill C' and is attached thereto by a bolt 6. It is thence extended in a curve forward and upward, having a reversed curve at its upper end, the rear portion of which reverse curve is provided with an eyebolt X, engaging and supporting the steering-post W, and the top portion of said curve supports the headlight 1. Said steering-post extends downward through suitable openings in the bars Q and Q' and is rotative therein, being provided with a T-head Y at its lower end, to which head are attached cables Z to operate the rudders, and extended thereto by way of pulleys 2 in the casings 3, secured to the bars B.

The upper bar Q has a downwardly-curved middle portion and upwardly and inwardly curved ends and is located above the wheel M and forward part of the chain L and in the vertical plane of the lower bar Q'. The rear curve of said bar Q engages and supports the wheel-house, being secured thereto by a bolt 4. Vertically across the rear curve of said bar is the saddle-post S, having the adjustable saddle-arm U and saddle V at its upper end and secured to the bar Q by suitable flanges R and T. The forward end of the bar Q engages the rearward curve in the upper part of the bar Q' and supports the same, being attached thereto by any suitable fastening. Hangers N, having suitable bearings for the shaft O and diverging arms at the respective ends, connect the bars Q and Q' and are firmly secured to the same.

By the described construction I provide a simple, cheap, and serviceable frame and wheel-house, the bar Q serving as a chain-guard and also supporting the wheel-house, the saddle-post S, and upper part of the hangers N. The lower bar Q' serves to support the lower ends of said hangers, the steering-post both above and below, and the headlight.

The hangers N serve as journal-bearing for the shaft O, and also as braces against longitudinal and vertical strains on the bars Q Q'. By said construction of wheel-house and frame they may be readily detached for shipment or storage by removing the bolts 4, 5, 6, and 7. So, also, by extending the lower part of the bar Q' and duplicating the upper bar Q, hangers N, and corresponding operative parts a tandem construction is easily made for two riders, as shown in Fig. 2, and by placing the described frame and operating parts in duplicate at the respective sides of the wheel-house and providing a single paddle-wheel J and two sprocket-wheels K, as indicated in Fig. 3, a suitable device for four, or double tandem, can be easily made, or by placing two single frames like that shown in Fig. 1 side by side, as are the tandem frames in Fig. 3, the device may be arranged to permit two to ride side by side.

Thus it will be seen that the frame described is adapted to be made single, as in Fig. 1, or tandem, as in Fig. 2; or, by placing two frames side by side, as in Fig. 3, two or four may be provided for to ride side by side in couples. It is also evident that the tandem arrangement may be extended indefinitely by properly extending the lower bar and repeating the upper bar and operative parts, as described for the tandem construction.

I do not limit myself to the construction of marine velocipedes solely.

The described invention can readily be utilized in the construction of land vehicles having two or more wheels to run on the ground.

Having thus fully described my invention, what I claim is—

1. In a marine velocipede in combination with a transverse beam, a paddle-wheel, adjustable bearings, and a housing for said wheel, oppositely-curved sills having their forward ends substantially horizontal and attached to said beam, and having inclined middle portions supporting said bearings and rearwardly-extended upper portions supporting the housing substantially as described.

2. In a marine velocipede a wheel-house consisting of oppositely-curved sills having substantially horizontal forward ends, inclined middle portions and rearwardly extended and curved upper ends, bearings adjustably attached to said inclined portions segmental bars concentric with said bearings, radial braces extending from opposite said bearings to said bars a socket-casting connecting said braces and sills, segmental panels connecting the outer ends of said braces, and a curved plate attached to said bars, substantially as described.

3. In a marine velocipede, the combination of a wheel-house a lower bar connected to the lower part of the wheel-house at its rear end, and upwardly curved at its forward end, and an upper bar in the same vertical plane with the lower bar, and having upwardly-curved ends, attached to the forward part of the

wheel-house, and to the upwardly-extended forward part of the lower bar, substantially as described.

4. In a marine velocipede, in combination with the wheel-house, a frame consisting of a lower bar having an upturned and curved forward end, and an upper bar in the same vertical plane, attached at its forward end to the upturned end of the lower bar, and attached near the rear end to the wheel-house, and hangers connecting said bars, substantially as described.

5. In a marine velocipede, in combination with the wheel-house, saddle-post, steering-post, and driving-shaft; a lower bar having an upturned forward end supporting the steering-post, an upper bar having upwardly and inwardly curved ends, and attached near its respective ends to said upturned end of the lower bar, and to the wheel-house, and having its rear curve engaging and supporting the saddle-post, and hangers attached at their respective ends to said upper and lower bar, and having journal-bearings for said driving-shaft, substantially as described.

6. In a marine velocipede, in combination with the paddle-wheel, and its shaft, the driving-shaft, the mechanism for connecting and driving said shafts, the saddle-post, and the steering-post; a wheel-house having oppositely-curved sills, adjustable bearings for the paddle-wheel shaft attached to said sills, a lower bar having its forward end curved upward and forward and supporting the steering-post, an upper bar in the same vertical plane, and having its respective ends curved upward and inward, and attached to the upturned forward part of the lower bar at its forward end, and attached to the wheel-house, and supporting the saddle-post near its rear end, and hangers having journal-bearings for the driving-shaft, and diverging arms attached to said bars, substantially as described.

7. In a marine velocipede, the combination of two parallel floats, beams connecting the same, a wheel-house secured to the rear beam, a wheel rotative in said wheel-house, a lower bar attached to said beams, and curved upward at its forward end, a steering-post, supported by said forward end, an upper bar having upwardly and inwardly curved ends and attached at its forward end to the upturned end of the lower bar, and to the wheel-house at its rear, a saddle-post extending vertically across the rear curved part of said bar, and supported thereby, hangers connecting the middle part of said bars, and provided with bearings, a shaft rotative in said bearings, having cranks and pedals attached, and means for transmitting motion from said shaft to the paddle-wheel shaft, substantially as described.

8. In a marine velocipede, the combination of two parallel floats, beams connecting the same, a wheel-house attached to the rear beam, a paddle-wheel rotative in said wheel-

house a lower bar attached to said beams and curved upward, at its forward end terminating in a reverse curve at the top, a headlight, and steering-post supported by said lower  
5 bar, an upper bar having a downward-curved middle, and upward and inward curved ends, and attached at its respective ends to the upturned lower bar, and to the wheel-house, a  
10 saddle-post extended vertically across the rear curved portion of said bar, and attached thereto, hangers connecting said bars, having

diverging arms, and journal-bearings, a shaft in said bearings, having cranks and pedals, and sprocket wheels and chains connecting said shaft to the paddle-wheel shaft, substantially as described. 15

In testimony whereof I affix my signature in presence of two witnesses.

LUTHER V. MOULTON.

Witnesses:

LEWIS E. FLANDERS,

LOIS MOULTON.





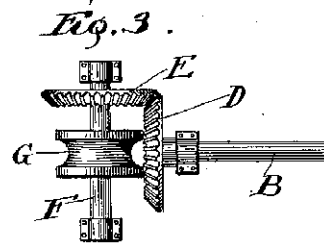
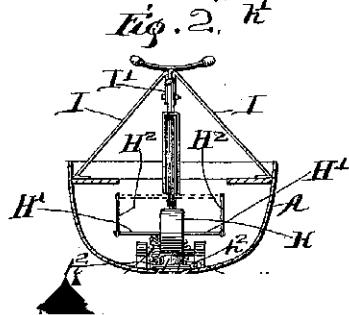
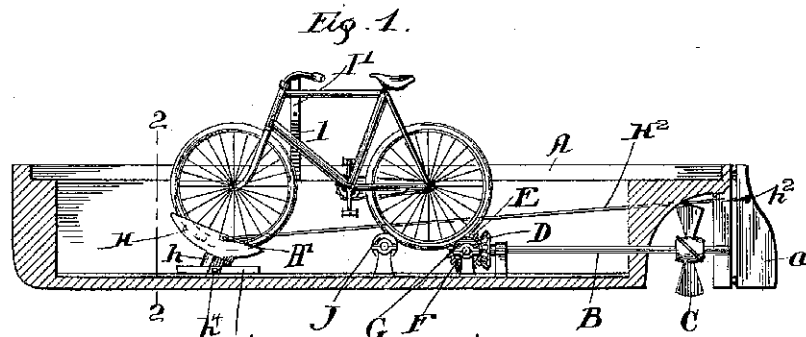
(No Model.)

2 Sheets—Sheet 1.

B. H. BRAZELTON.  
BICYCLE PROPELLED BOAT.

No. 587,074.

Patented July 27, 1897.



(No Model.)

2 Sheets—Sheet 2.

B. H. BRAZELTON.  
BICYCLE PROPELLED BOAT.

No. 587,074.

Patented July 27, 1897.

Fig. 7.

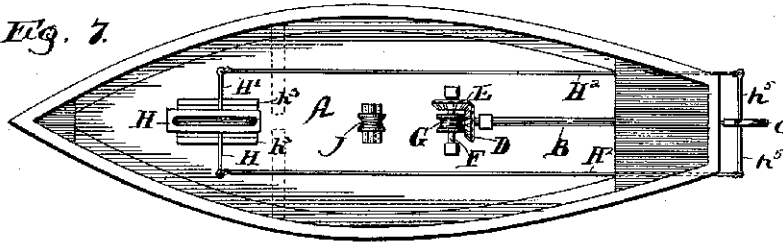


Fig. 8.

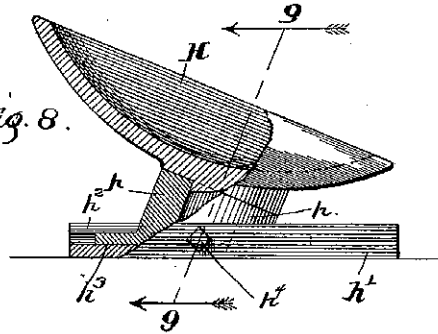
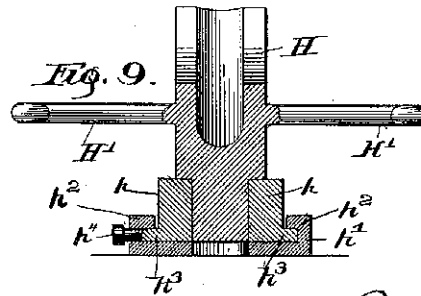


Fig. 9.



Witnesses:

Chas. O. Sherway.  
M. L. Shahan.

Inventor:

Bird H. Brazelton  
by N. L. Jones & P. H. Smith  
Attys

# UNITED STATES PATENT OFFICE.

BIRD H. BRAZELTON, OF CHICAGO, ILLINOIS.

## BICYCLE-PROPELLED BOAT.

SPECIFICATION forming part of Letters Patent No. 587,074, dated July 27, 1897.

Application filed August 3, 1896. Serial No 601,468. (No model.)

*To all whom it may concern:*

Be it known that I, BIRD H. BRAZELTON, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bicycle-Propelled Boats, of which the following is a specification.

My invention relates to certain improvements in bicycle-propelled boats; and to such end it consists in providing an ordinary boat with suitable propelling mechanism adapted through certain interposed gearing to be driven by an ordinary bicycle, no alteration of the bicycle being necessary.

The invention is fully illustrated in the specification and shown in the accompanying drawings, in which—

Figure 1 is a central vertical section of my improved boat and showing an ordinary safety-bicycle in working relation therewith. Fig. 2 is a cross-section in line 2 2, Fig. 1. Fig. 3 is a top plan of the gearing used in connection with my improved boat. Fig. 4 is a detail perspective view of a frame adapted to hold the bicycle in proper working relation to the gearing. Figs. 5 and 6 are central vertical sections of slight modifications. Fig. 7 is a plan view of a boat and showing the steering apparatus therefor. Fig. 8 is a view partly in side elevation and partly broken away to show construction of a shoe used in connection with the steering apparatus, and Fig. 9 is a cross-section through the line 9 9, Fig. 8.

Referring to the drawings, A represents an ordinary boat provided with the usual end-

the front wheel of a bicycle, this shoe being pivoted in a longitudinally-adjustable block  $h$  and the pivot being in line with the pivoted steering-head of the bicycle. A guide  $h'$  is secured to the lower portion of the boat, this guide being formed with overhanging lips  $h^2$ , (see Figs. 2, 8, and 9,) between which slides the plate  $h^3$ , upon which the block  $h$  is formed. A set-screw  $h^4$  is provided upon the guide, so that the plate  $h^3$  may be slid along the guide to the proper point and then retained in place by the set-screw. Inasmuch as a great variety of wheels is possible, I have made the shoe  $H$  longitudinally adjustable in order to accommodate different lengths of bicycles. Two arms  $H'$   $H'$  extend from the shoe and are connected with the rudder by means of a pair of ropes  $II^2$ . It is evident that, inasmuch as the front wheel rests in the shoe  $H$ , the boat may be properly guided by simply turning the handle-bars of the bicycle, thereby operating the rudder through the ropes  $II^2$ .

In order to properly support the bicycle and prevent any lateral movement thereof, I have provided a frame for this purpose, which consists in two diagonal members  $I$   $I$ , extending from the sides of the boat to the center thereof at a point about the height of the horizontal member of a bicycle, where they are bent downward into two vertically-extending parallel portions  $I'$   $I'$ . As seen in Figs. 1 and 2, the upper or horizontal member of a bicycle is held between the portions  $I'$   $I'$  of the frame, a bolt  $i$  being preferably put through the ends thereof, as seen in Fig. 4, thereby clamping the bicycle firmly in the framework.

The modification in Fig. 5 shows a boat provided with side-wheel propellers, and in this case the propeller-shaft B is geared to the friction-roller shaft F, a spur-gear D being  
 5 rigidly mounted upon the propeller-shaft and a pinion E upon the friction-roller shaft. In Fig. 6 a stern-wheel is shown, the same being connected with the shaft B by means of sprockets and a chain, the gearing being similar to that shown in Fig. 5.

From the above it will be clearly seen that the device is extremely simple and can be operated by any of the ordinary bicycles, the great advantage being that no alteration of  
 10 the bicycle is necessary, but is simply placed in position and the boat is ready for operation.

Having now described and explained my invention, what I claim as new, and desire to secure by Letters Patent, is—

20 1. The combination with a boat and propeller, of two rollers adapted to support the driven wheel of a bicycle, one of said rollers being an idler and the other connected with the propeller, the frame I, secured to the sides  
 25 of the boat and extending toward the forward end of a bicycle and having the vertically-extending portions I', I', adapted to embrace

one of the members of the frame of the bicycle, and the clamping-bolt *i*, adapted to clamp the members I', I', upon the frame of  
 30 the bicycle.

2. The combination with a boat, of a propeller adapted to receive its motion from the driven wheel of a bicycle, a shoe H, adapted to receive the steering-wheel of a bicycle and  
 35 pivoted in line with the steering-head of the bicycle, the guide *h'*, adapted to support the shoe H, said shoe being longitudinally movable in said guide, and suitable means for holding it in any desired position therein. 40

3. The combination with a boat and propeller adapted to receive its motion from the driven wheel of a bicycle, of the shoe H, adapted to receive the steering-wheel of a bicycle, the plate *h*<sup>3</sup>, having the block *h*, a  
 45 guide *h'*, the plate being longitudinally movable in the guide, the set-screw *h*<sup>4</sup>, adapted to hold the plate at any desired position, the shoe H, being pivoted in the block in line with the steering-head of the bicycle.

BIRD H. BRAZELTON.

Witnesses:

CHAS. O. SHERVEY,  
 M. L. SHEAHAN.

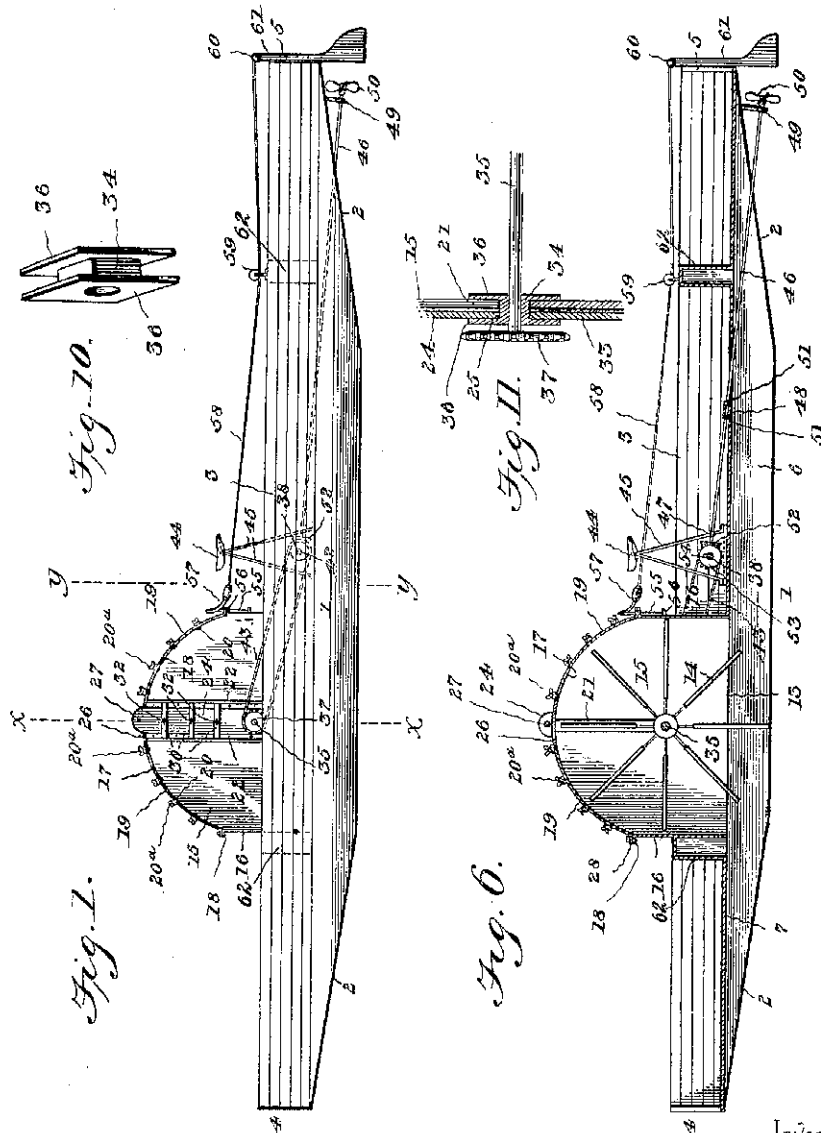
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3 Sheets—Sheet 1.

H. C. JOHNSON.  
MARINE VELOCIPEDE.

No. 599,237.

Patented Feb. 15, 1898.



Witnesses  
Edw. M. Munn  
Edwin Cruise.

By His Attorneys,

C. A. Snow & Co.

Inventor  
Hilary C. Johnson

(No Model.)

3 Sheets—Sheet 2.

H. C. JOHNSON.  
MARINE VELOCIPED.

No. 599,237.

Patented Feb. 15, 1898.

Fig. 2.

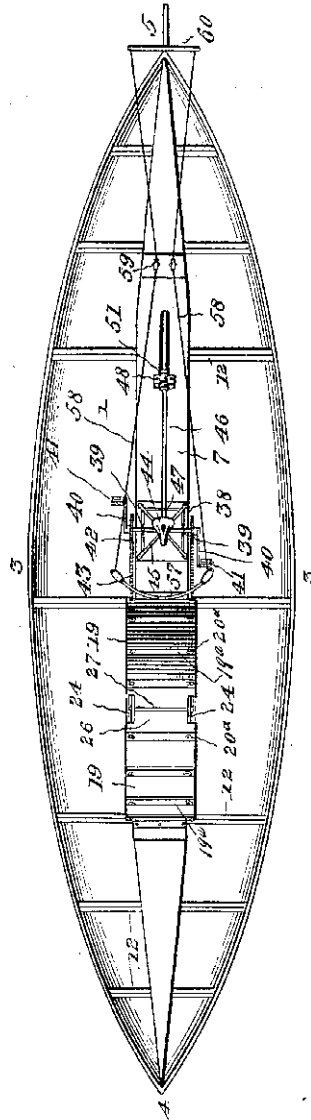
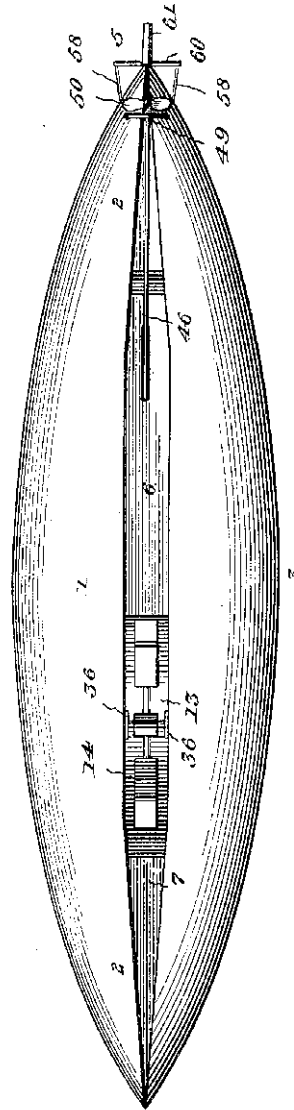


Fig. 3.



Inventor  
Hilary C. Johnson

Witnesses

Edw. Monroe By His Attorneys,  
Edwin Cruise

C. A. Snow & Co.

(No Model.)

3 Sheets—Sheet 3.

H. C. JOHNSON.  
MARINE VELOCIPED.

No. 599,237.

Patented Feb. 15, 1898.

Fig. 4.

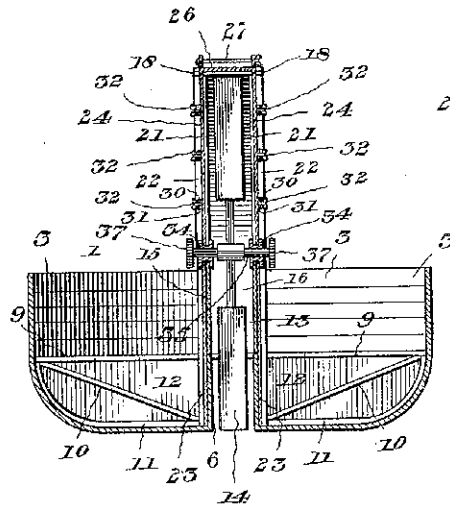


Fig. 5.

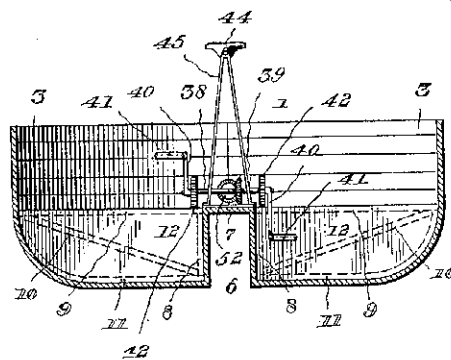


Fig. 8.

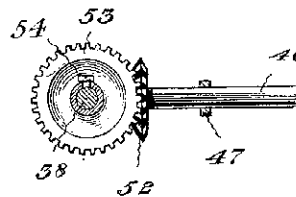
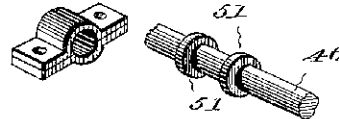


Fig. 9.

Inventor

Hilary C. Johnson,

Witnesses

E. A. Monroe  
Edwin Cruise.

By his Attorneys.

C. A. Snow & Co.



# UNITED STATES PATENT OFFICE.

HILARY C. JOHNSON, OF MEDIA, PENNSYLVANIA.

## MARINE VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 599,237, dated February 15, 1898.

Application filed June 28, 1897. Serial No. 642,636. (No model.)

### *To all whom it may concern:*

Be it known that I, HILARY C. JOHNSON, a citizen of the United States, residing at Media, in the county of Delaware and State of Pennsylvania, have invented a new and useful Marine Velocipede, of which the following is a specification.

This invention relates to marine velocipedes; and its object is to improve the construction of devices of this character, whereby they may be more easily propelled and maneuvered and whereby the paddle-wheel can be easily removed from its bearings for the purposes of repair or otherwise.

With these objects in view the invention consists of the several details of construction and combination of parts, as will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a marine velocipede made in accordance with my invention. Fig. 2 is a top plan view. Fig. 3 is a bottom plan view. Fig. 4 is a vertical transverse section on the line  $x$   $x$  of Fig. 1. Fig. 5 is a similar section on the line  $y$   $y$  of Fig. 1. Fig. 6 is a vertical longitudinal section. Fig. 7 is a view in perspective of portions of the wheel-casing separated. Fig. 8 is a detail perspective view of the middle portion of the propeller-shaft and its bearing. Fig. 9 is a detail view of the gearing to connect the crank and propeller-shaft. Fig. 10 is a perspective view of one of the bearings for the paddle-wheel shaft. Fig. 11 is a detail sectional view of a portion of the wheel-casing and the bearing for the paddle-wheel shaft.

Similar reference-numerals indicate similar parts in the several figures.

1 indicates the hull of the boat, the bottom of which is inclined upwardly at each end, as indicated at 2, and the opposite sides 3 of which converge at their ends to the stem and stern posts 4 and 5, so that each end of the boat is tapering.

6 indicates a water-passage which extends longitudinally of the bottom of the hull, and the upper wall 7 of which is in substantially the same horizontal plane as the lower ends of the stem and stern posts.

The framework of the boat consists of two spaced rows of vertical posts 8, a series of

horizontal cross-braces 9, connected to the upper ends of the posts 8, a series of diagonal braces 10, which extend from the ends of the horizontal braces to the lower ends of the vertical posts, and a series of ribs 11. The water-passage will be formed by securing the planks which form the vertical sides of the passage to the opposing sides of the vertical posts 8, and the planks which will form the top walls 7 of the water-passage will be secured to the under side of the cross-braces 9, between the vertical posts 8, thereby forming a smooth surface, with which the water will be in contact, and so offering but little frictional resistance to the forward movement of the boat. A series of bulkheads 12 are formed at each side of the water-passage, the vertical posts 8, braces 9 and 10, and the ribs 11 serving as frameworks for the bulkheads. The planking of the hull will be secured to the edges of the bulkheads and the ribs 11 in the usual manner, and the bulkheads will give strength and stiffness to the hull.

The top wall 7 of the waterway is provided with an opening 13 intermediate the ends of the boat, through which the paddle-wheel 14 extends into the water-passage. The portion of the paddle-wheel which is above the top of the water-passage will be inclosed by a sheet-metal casing, of which 15 indicates the sides and 16 the ends, which are secured to the sides in any suitable manner. The lower ends of the sides and ends will be secured to the top wall 7 of the water-passage in any suitable manner. The upper edges 17 of the sides are curved in the arc of a circle and are provided with laterally-extending flanges 18, and the upper ends of the end pieces 16 are also provided with laterally-extending flanges 18.

19 indicates the cap-sections, which are secured to the flanges 18 by means of cross-bars 19<sup>a</sup>, bolts 20, and thumb-nuts 20<sup>a</sup>. Each side is provided with a vertical slot 21, which extends from its upper edge downwardly, and on each side of these slots stiffening-bars 22 are secured to the sides by riveting or otherwise, and the lower ends of these bars will be firmly secured to the planks, which will be secured to the outer sides of the vertical posts 8.

23 indicates reinforcing-plates which are riveted or otherwise firmly secured to the sides

15, between the stiffening-bars 22, and extend from the lower end of the slots 21 to the lower ends of the stiffening-bars.

24 indicates sliding plates, each of which is provided at its lower end with a rectangular recess 25. These sliding plates are connected at their upper ends by a cap-plate 26 and by a bolt 27, which extends across above the cap-plate. These plates are adapted to slide over the sides 15, between the stiffening-bars 22, and to engage with their lower ends the upper ends of the reinforcing-plates 23. When the parts are in position, the ends of the cap-sections 19 will preferably overlap the ends of the cap-plate 26, and the overlapping ends will be secured to the flanges 18 by the same bolts. A suitable packing 28 will be inserted between the flanges 18 and the edges of the plates in order to make a water-tight joint.

The flanges 18 are cut away between the bars 22 in order to permit the sliding plates 24 to lie close to the sides of the casing. The stiffening-bars 22 are made of angle-iron, and the projecting members of these bars are provided with a series of alining openings 29 for the reception of a series of sliding bars 30. Each of the sliding plates is provided with a series of stiffening-ribs 31, which are so arranged that when the sliding plates are in position the ribs will be immediately opposite the sliding bars 30. Each of the sliding bars is provided with a threaded opening, through which a set-screw 32 passes to engage the ribs 31, and when these set-screws are tightened up the sliding plates will be forced into close engagement with the sides of the casing. Suitable packing 33 will be inserted between the sliding plates 24 and the sides of the casing on each side of the slots 21 in order to make a water-tight joint.

34 indicates boxes which are rectangular on their exterior surface and are bored out to receive the shaft 35 of the paddle-wheel 14. These rectangular boxes are adapted to fit in the slots 21 and be supported on the upper edge of the reinforcing-plate 23 and the bottom wall of the slot 21, and each box is provided with flanges 36, adapted to fit closely against the interior and exterior faces of the respective sides of the casing. The shaft 35 projects at each end beyond the casing and is provided with sprocket-wheels 37. When it is desired to remove the wheel for any purpose, the thumb-nuts 20<sup>a</sup> will be removed from the bolts 30 and the cap-plates 19 removed. The set-screws 32 will also be loosened, and the sliding plates 24 and the cap-plate 26 can then be removed, when the wheel and its journal-boxes can be lifted out through the opening in the top of the casing, and in order to replace it the operation just described will be performed in reverse order.

Under normal conditions the boat will not be submerged above the top of the water-passage; but in the event of some accident occurring that would cause the water to fill the

interior of the hull as soon as the water closes the opening in the journal-boxes of the paddle-wheel shaft the casing inclosing the paddle-wheel will become an air-tight chamber and by its buoyancy serve to prevent the boat from entirely sinking.

38 indicates a crank-shaft which is supported in suitable bearings 39, supported on the top wall of the water-passage, and this shaft is provided with a crank 40 at each end, and each crank carries a pedal 41.

42 indicates sprocket-wheels rigidly secured on the crank-shaft 38 in alinement with the sprocket-wheels 37 on the paddle-wheel shaft 35, and chains 43 connect the sprocket-wheels 42 and 37.

44 indicates a seat supported on a suitable frame 45, which extends upwardly from the top wall of the water-passage. The pedal-cranks are so arranged that in operating them the rider's feet will work below the top of the water-passage, on each side thereof.

46 indicates a propeller-shaft which inclines downwardly from its front to its rear end. The front end of the propeller-shaft is supported in a bearing 47, which is secured on the seat-frame 45, and its middle portion is supported in a suitable bearing 48, secured in the top wall of the water-passage, and at this point the shaft passes through the top wall into the water-passage and extends to the rear end of the boat, where it is supported in suitable brackets 49, secured to the stern of the boat and provided with a suitable propeller 50. The shaft is provided with suitable collars 51 on each side of the bearing 48 in order to prevent the shaft from moving endwise and to give the necessary thrust bearing to propel the boat in either direction. The shaft is provided near its front end with a beveled pinion 52, adapted to mesh with a beveled gear 53, carried by the crank-shaft 38. This beveled gear 53 is adjustable on the crank-shaft in order that it may be moved into or out of engagement with the pinion 52 on the propeller-shaft, and it is held in its adjusted position by means of a set-screw 54, which passes through its hub to engage the crank-shaft 38.

55 indicates a vertical shaft which is supported in suitable bearings 56, secured to the rear end of the paddle-wheel casing, and this shaft carries at its upper end a handle-bar 57, from the ends of which ropes, chains, or wires 58 lead under pulleys 59, which are secured to a fixed part of the boat, to a cross-bar 60 on the upper end of the rudder-post 61. The handle-bar 57 is so located that the operator when in the seat 44 can conveniently grasp it and steer the boat as desired.

Two or more air-tight chambers 62 are arranged above the water-passage and communicate at their lower ends therewith. These air-chambers serve to give buoyancy to the boat, and in the case of accident will aid the paddle-wheel casing in preventing the boat from entirely sinking.

From the above description it will be seen that I have produced a marine velocipede which can be propelled either by the paddle-wheel or the propeller alone, or by both together. By having the ends of the bottom to incline upwardly and outwardly the boat can be maneuvered much easier, as it will practically turn on a pivot, for, as before stated, under normal conditions the stem and stern of the boat will not be in the water. The inclination to the ends of the bottom will also facilitate running the boat up on a bank to effect a landing, and will also make it easier for the boat to be backed off from the bank. It is also obvious that by constructing the paddle-wheel casing in the manner described the paddle-wheel may be easily and quickly removed for the purpose of repair or otherwise and be as easily replaced in position. While I have illustrated and described my invention as being propelled by manual power, it is of course obvious that the crank-shaft could be suitably connected to any kind of motor in order to give it the necessary rotary movement.

It will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described the invention, what I claim is—

1. In a marine velocipede, a hull tapering longitudinally to each end and having a bottom inclining upwardly and outwardly at each end and provided with a water-passage extending longitudinally thereof from end to end, the upper wall of said passage being in substantially the same horizontal plane as the lower ends of the stem and stern posts, combined with a paddle-wheel mounted to revolve in said water-passage intermediate the ends of the boat, suitable means to revolve the paddle-wheel, and a steering mechanism, substantially as described.

2. In a marine velocipede, a hull having a water-passage in its bottom extending from end to end thereof, the top wall of said passage being provided with an opening intermediate its ends, combined with a paddle-wheel casing fitted over said opening and firmly secured at its lower end, the top of said casing being removable and its sides provided with slots open at their upper ends, and a paddle-wheel having its shaft journaled in boxes removably supported in said slots, substantially as described.

3. In a marine velocipede, a paddle-wheel

casing secured at its lower end to the hull and adapted to inclose the upper portion of the paddle-wheel, the cap of said casing being in sections removably bolted to the sides and ends of the casing, and the sides having vertical slots open at their upper ends to receive the journal-boxes of the paddle-wheel shaft, sliding plates to close said slots, and means to clamp the sliding plates to the casing, substantially as described.

4. In a marine velocipede, a paddle-wheel casing secured at its lower end to the hull and adapted to inclose the upper portion of the paddle-wheel, the cap of said casing being in sections removably bolted to the sides and ends of the casing, and the sides having vertical slots open at their upper ends to receive the journal-boxes of the paddle-wheel shaft, sliding plates to close said slots, means to clamp the sliding plates to the casing, a packing interposed between the cap-sections and the sides and ends of the casing, and between the sliding plates and the sides of the casing to make water-tight joints, substantially as and for the purpose described.

5. In a marine velocipede, the combination of a paddle-wheel, a casing firmly secured at its lower end to the hull of the boat to inclose the upper portion of the paddle-wheel, the upper ends of the side and end pieces of said casing being provided with lateral flanges, and said sides having vertical slots open at their upper ends, cap-sections removably bolted to the said flanges, stiffening-bars secured to the casing on each side of said slots, reinforcing-plates secured to the sides between the bearings below the slots, rectangular boxes fitted in said slots and supported on the lower walls of the slots and the upper ends of the reinforcing-plates, said boxes serving as bearings for the paddle-wheel shaft, sliding plates fitting between the bars and having recesses at their lower ends to receive the said boxes, a cap-plate connecting the upper ends of the sliding plates and adapted to be removably secured to said flanges, sliding bars supported in the stiffening-bars, and set-screws working through the sliding bars and engaging the sliding plates, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HILARY C. JOHNSON.

Witnesses:

H. P. TUEN,  
R. H. THOMSON.

No. 618,555.

Patented Jan. 31, 1899.

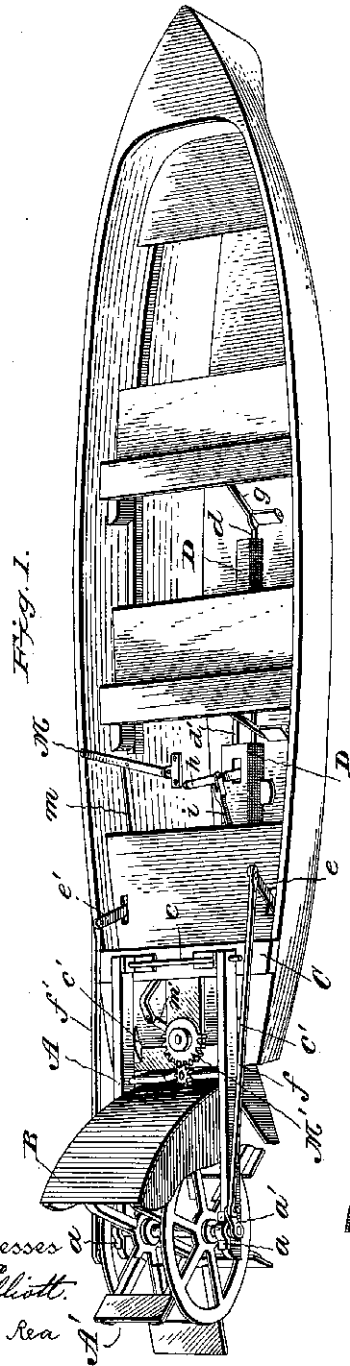
A. BELZ.

PROPULSION MECHANISM FOR BOATS.

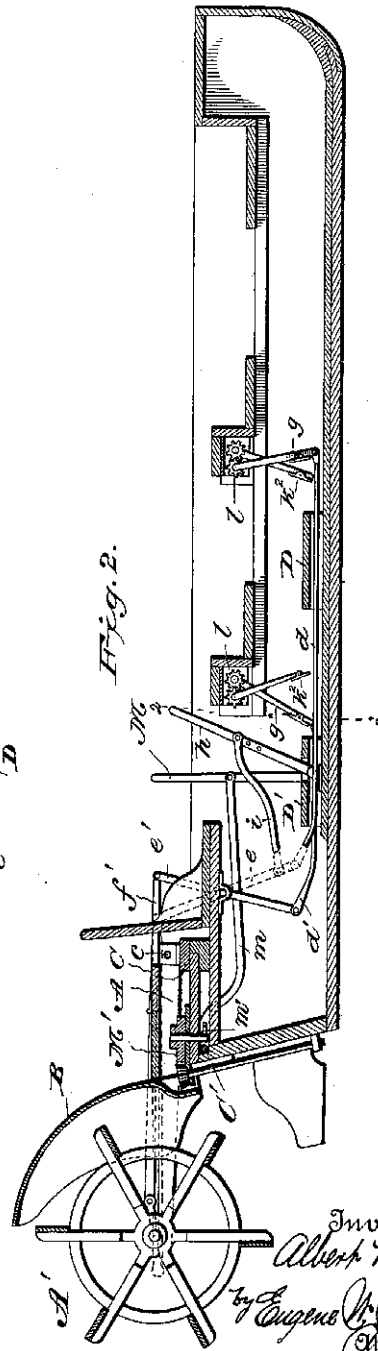
(Application filed Apr. 26, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
L. S. Elliott.  
Geo. W. Rea



Inventor  
Albert Belz.  
by Eugene W. Johnson,  
Attorney

No. 618,555.

Patented Jan. 31, 1899.

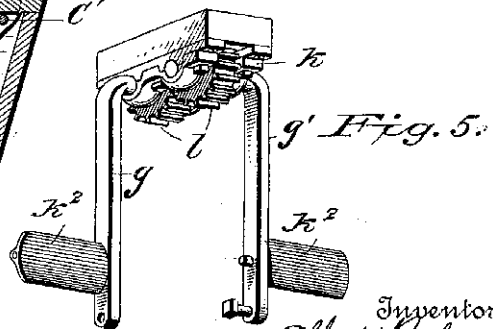
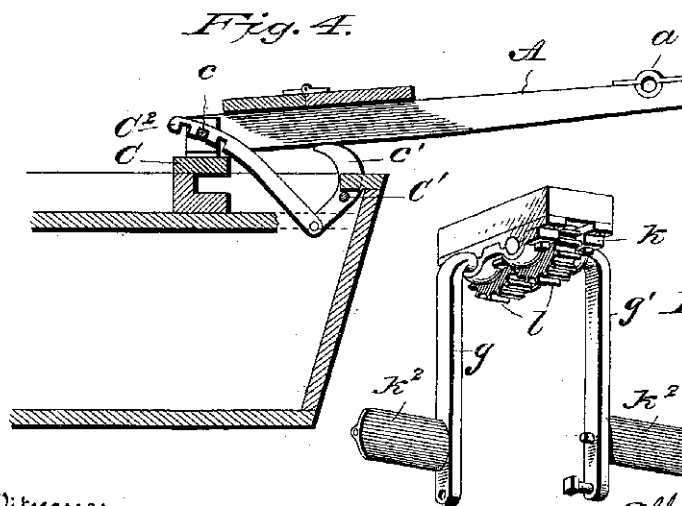
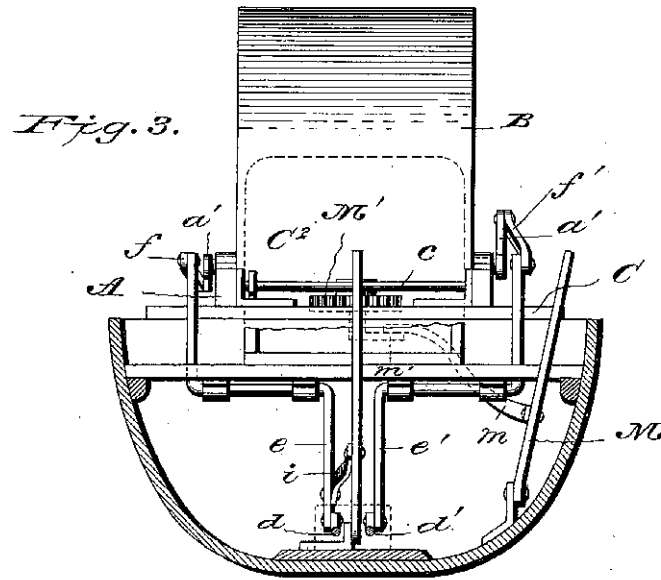
A. BELZ.

PROPULSION MECHANISM FOR BOATS.

(Application filed Apr. 26, 1898.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses  
*E. S. Elliott.*  
*Geo. W. Rea.*

Inventor  
*Albert Belz.*  
by *Engelb. W. Johnson.*  
Attorney

# UNITED STATES PATENT OFFICE.

ALBERT BELZ, OF APPLETON, WISCONSIN.

## PROPULSION MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 618,555, dated January 31, 1899.

Application filed April 26, 1898. Serial No. 678,883. (No model.)

### *To all whom it may concern:*

Be it known that I, ALBERT BELZ, a citizen of the United States, residing at Appleton, in the county of Outagamie and State of Wisconsin, have invented new and useful Improvements in Propulsion Mechanism for Boats, of which the following is a specification.

This invention relates to certain new and useful improvements in mechanism for the propulsion of small boats, the object of my improvement being to provide a simple and effective means for propelling small boats by foot-power, the mechanism being so positioned in the hull of the boat that there will be but few parts which project above the sides thereof; also, to provide improved steering-gear and means for raising and lowering the stern-wheel, which is actuated by the propulsion mechanism.

The invention consists in the construction and combination of the parts and general arrangement thereof, as will be hereinafter specified.

In the accompanying drawings, Figure 1 is a perspective view of a boat with my improvements applied thereto. Fig. 2 is a longitudinal sectional view; Fig. 3, a transverse sectional view through the line 2 2 of Fig. 2 looking aft. Fig. 4 is a detail sectional view showing the means for raising and lowering the stern-wheel-supporting frame, and Fig. 5 is a detail perspective view of a pair of the foot-pedals detached.

A refers to a stern-wheel-supporting frame made up of side bars having at their rear ends bearings *a*, in which is seated a transverse shaft, upon which the stern-wheel *A'* is mounted, and beyond the bearings the shaft carries crank-arms *a'*, set quartered. The paddle-wheel is of ordinary construction, and the radial arms thereof are braced by suitable rims, as shown.

B refers to a suitable fender or shield, the side pieces thereof overlying the paddles and being rigidly attached to the side bars of the stern-wheel-supporting frame. The side bars are pivotally attached to a cross-piece C, attached to the gunwales of the boat, and when lowered the side bars of the frame may rest upon the stern of the boat. Through the bearings attached to the cross-piece C and the frame is a rod *c*, which forms the con-

necting means between the boat and wheel-supporting frame.

C' refers to a transverse shaft which is journaled adjacent to the stern of the boat, and upon this rod or shaft are rigidly secured cams *c'*, and to one of the cams is attached an arm C<sup>2</sup>, having notches in the free end thereof, which are adapted to engage with the rod *c*, and when in engagement therewith will hold the side bars of the pivoted frame at an inclination, thus providing means for changing the depth at which the paddles will enter the water or for holding the paddle-wheel entirely out of the water.

To the bottom of the boat are secured hollow blocks D D', and through these blocks pass rods *d d'*, the rod *d* being pivotally attached to the lower end of a lever *e*, and to the upper end of said lever is attached a rod *f*, which extends to one of the crank-arms *a'*. The forward end of the rod *d* is attached to the lower end of a foot-pedal *g*.

*h* refers to a hand-lever which is pivoted to a bearing attached to the bottom of the boat, said lever being passed through an aperture in the block D', and this hand-lever is connected by a rod *i* to the lever *e*, the connecting-rod *i* being bent, as shown. The lever *e* is located on one side of the boat and is connected with a paddle-wheel by a rod *f*, and on the opposite side of the boat from the lever *e* is a similarly constructed and mounted lever *e'*, which is connected to the crank of the paddle-shaft by a rod *f'*. To the lower end of the lever *e'* is attached a rod *d'*, which extends to the lower end of the foot-lever *g'*. The arrangement and organization of the parts are such that when the foot-lever *g'* is inclined toward the stern the lever *e'*, to which it is attached, will have its lower portion similarly inclined, and when the foot-lever *g'* is rearwardly inclined the foot-pedal *g* will be forwardly inclined, said lever being on the opposite side of the keel from the lever *g'*. The connecting-rod *i* between the hand-lever *h* and lever *e* may be readily separated from the hand-lever, and said hand-lever is merely used in starting and stopping or changing the direction of rotation of the paddle-wheel. Beneath the thwarts or cross-pieces, rear of the seats, are attached bearings *k*, in which are journaled the bent ends of the foot-levers *g g'*,

which carry at their lower ends pedals  $k^2$  of any suitable type. The upper bent ends of the foot-levers  $g g'$ , between the bearings  $k$ , have rigidly attached thereto pinions  $l$  or segmental racks, if desired, which are in mesh with each other, and when one of the foot-levers is moved either forward or aft a reverse movement will be given to the adjacent foot-lever. Thus the operator exerts power through one of the foot-levers with both legs. It will also be noted that the foot-levers are arranged at opposing angles, thus to a great extent overcoming the dead-center.

$M$  refers to a hand steering-lever which is connected by a rod  $m$  to a crank-arm  $m'$ , which extends from a shaft upon which is mounted a pinion or segmental rack  $M'$ , the same meshing with a pinion or gear-wheel on the upper end of the rudder-post. This arrangement affords a cheap and effective steering-gear, and when the steering-lever  $M$  is moved forward the rudder will be turned to starboard.

In operation the occupants of the boat will be seated looking or facing toward the bow, and they will place their feet upon the pedals of the foot-levers and by oscillating the same will reciprocate the bars  $d d'$ , thus rocking the levers  $e e'$  and reciprocating the rods connected to the shaft of the paddle-wheel, so as to impart a rotary motion thereto. The operator on the rear seat can manipulate with his hands the steering-lever and the lever for stopping or changing the direction of rotation of the paddle-wheel.

It will be noted that the propulsion mechanism is located principally beneath the seats, that the rods are close to the keel, and that the foot-pedals are geared together in pairs and are arranged at different angles, which insures steadiness of movement and equalizing the power applied, the foot-levers being connected through the crank-shaft, upon which the paddle-wheel is mounted, and the connecting-rods. A boat thus equipped may be provided with the ordinary oar-locks, and if oars are used it is not necessary to remove any part of the propulsion mechanism, as it will not interfere with the use of oars.

I am aware that it has been proposed to propel small boats by the use of stern-wheels operated by hand-levers, and I do not claim such construction, as I consider hand-levers objectionable from several points of view, among which may be mentioned the operation of hand-levers being above the gunwales of the boat the movement of the body in operating them renders the boat less stable. The operators do not have their hands free for use for fishing, gunning, &c.

With the arrangement shown the motion is near the keel of the boat, and, if needed, one of the operators may not only use his feet

and legs to drive the boat, but also his hands and arms. The number of foot-levers may be increased in accordance with the length of the boat.

Having thus described my invention, what I claim as new is—

1. In a propulsion mechanism for boats, the combination of a pair of foot-levers having pedals which are in gear with each other, one of the foot-levers being connected to a driving-rod, substantially as shown.

2. In a propulsion mechanism for boats, the combination with a pair of foot-levers arranged side by side, said foot-levers being in gear with each other so that one will move forward while the other moves aft, said foot-levers being connected with a driving-rod, substantially as shown.

3. In a propulsion mechanism for boats, the combination with a pair of driving-rods connected with a paddle-wheel and with separate pairs of foot-levers, of the foot-levers each pair thereof being positioned side by side and in gear with each other so that during the range of movement of the foot-levers one pair will not be parallel with the other pair, substantially as and for the purpose set forth.

4. The combination in a propulsion mechanism for boats having a stern paddle-wheel and means for imparting a rotary motion thereto, of a supporting-frame for the paddle-wheel which is pivotally attached to the hull of the boat, a cross-bar in rear of the means for connecting the paddle-wheel-supporting frame to the boat, cams rigidly attached to the cross-bar so as to engage the supporting-frame, one of the cams having a depending portion to which is attached a notched arm which arm is adapted to engage with a cross-bar which connects the paddle-wheel-supporting frame to the boat, substantially as shown and for the purpose set forth.

5. In a propulsion mechanism for boats, the combination of foot-levers arranged in pairs, each pair of the foot-levers being in gear adjacent to their fulcrums, one of each pair of said foot-levers being connected to reciprocating rods, oscillating levers connected to the reciprocating rods and to rods which extend from opposite ends of the oscillating levers to cranks on the shaft of a paddle-wheel, and a hand-lever connected to one of the oscillating levers, the parts being organized substantially as shown and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALBERT BELZ.

Witnesses:

FRANK LEIMER,  
E. W. FRANK.

No. 640,513.

Patented Jan. 2, 1900.

P. E. DOEGE.  
PROPULSION OF BOATS.

(Application filed May 1, 1899.)

(No Model.)

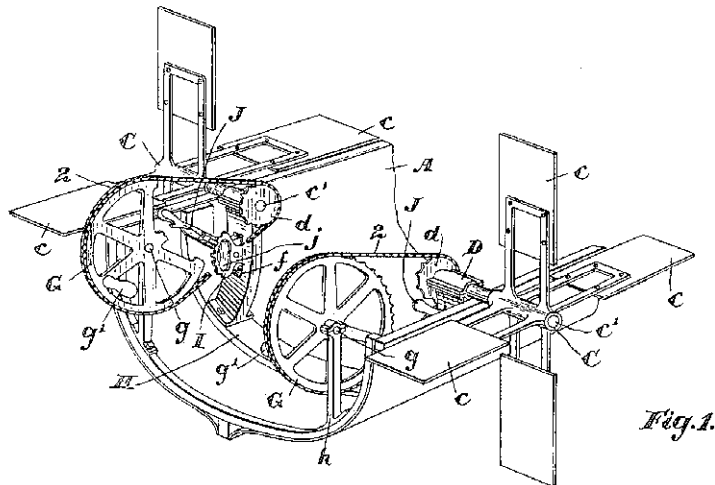


Fig. 1.

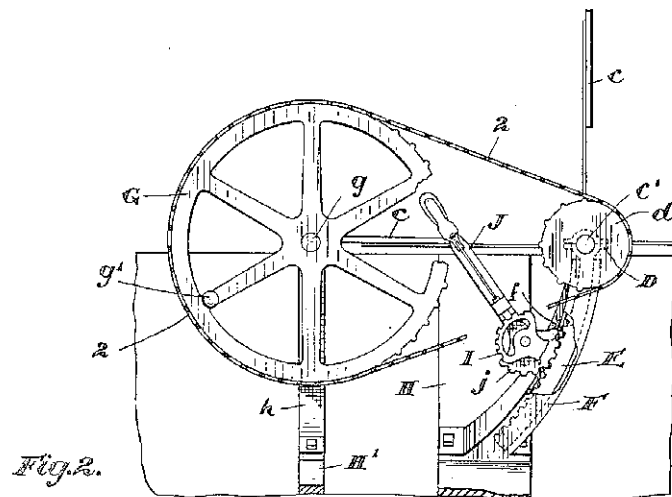


Fig. 2.

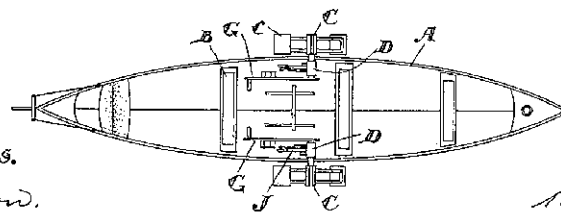


Fig. 3.

Witnesses.

H. Harrison.

J. W. Adams.

Inventor.

P. E. Doege.

By F. L. Sturtevant & Co.  
Atty.



# UNITED STATES PATENT OFFICE.

PAUL EMIL DOEGE, OF TORONTO, CANADA.

## PROPULSION OF BOATS.

SPECIFICATION forming part of Letters Patent No. 640,513, dated January 2, 1900.

Application filed May 1, 1899. Serial No. 715,250. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL EMIL DOEGE, farmer, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in the Propulsion of Boats, of which the following is a specification.

My invention relates to improvements in propulsion of boats; and the object of the invention is to devise a simple means for propelling a boat by paddles and a simple means for adjusting the paddles vertically for shallow water; and it consists, essentially, of two paddle-wheels having the axle thereof journaled in bearings at the top of an adjustable rack held in the standard, the inner ends of

the axles *g* of the major sprocket-wheels *G*. The major sprocket-wheels on each side of the boat are connected to the minor sprocket-wheels *d* by the sprocket-chains *2*. Each major sprocket-wheel is provided with a propelling-handle *g'*.

*I* is a quadrant forming part of the socket-standards *F*, and *J* is a lever provided with the usual spring-plunger designed to engage with one of the notches of the quadrant *I*. The lower end of the lever is formed in the shape of a quadrant *j* and extends through a slot *f* in the standard *F* and meshes with the toothed rack *E*.

In deep water of course the axle of the paddle may be left in the position shown in the

the axles for same extending inwardly as shown, the racks provided with suitable journal-bearings at the top thereof for the axles of the paddle-wheels, the socket-standards, the sprocket-wheels on the ends of the axles, means for driving the sprocket-wheels independently as specified, the quadrant forming part of the standard, the lever pivoted on the said quadrant and having a spring-plunger

adapted to engage with the notches thereof, and a quadrant formed on the inner end of the lever and meshing with the racks in the concentric socket-standards as and for the purpose specified.

PAUL EMIL DOEGE.

Witnesses:

B. BOYD,  
W. ARMS.

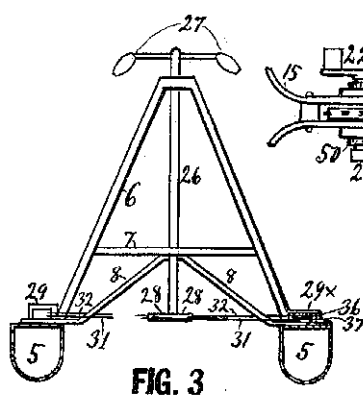
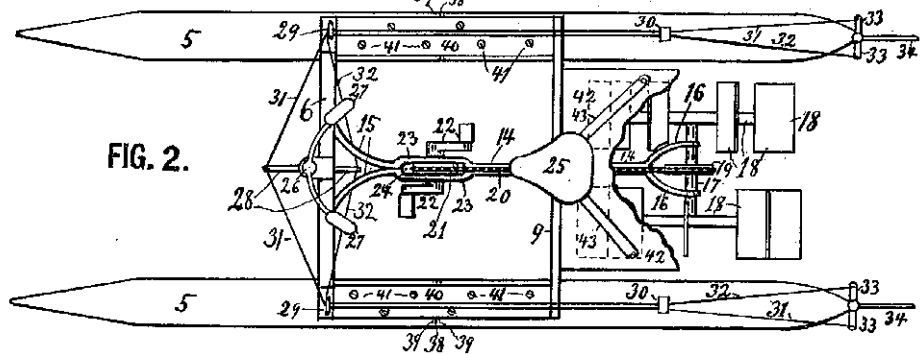
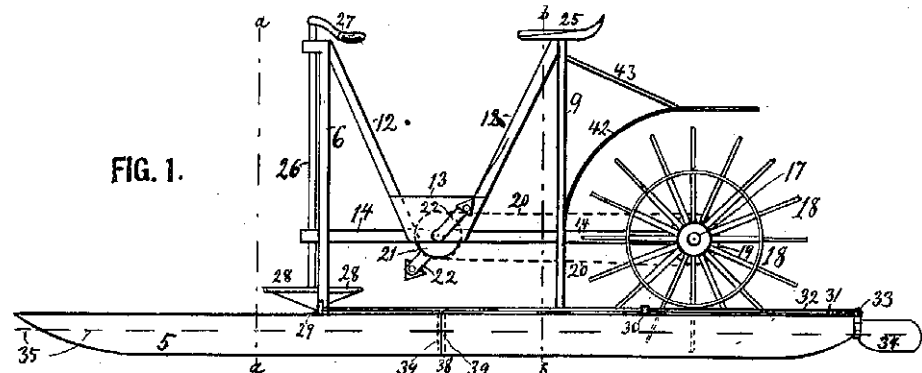
No. 642,683.

Patented Feb. 6, 1900.

J. A. ERICKSON.  
WATER BICYCLE.

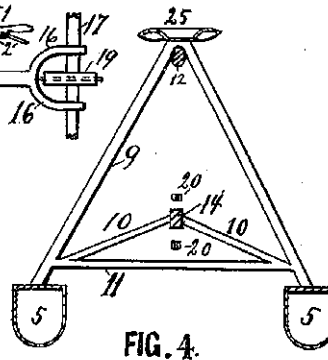
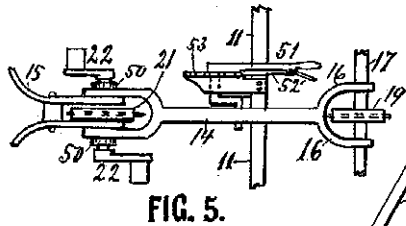
(Application filed May 12, 1899.)

(No Model.)



WITNESSES:

D. E. Carlson.  
C. C. Carlson



INVENTOR:

John A. Erickson.  
BY his ATTORNEY:  
A. M. Carlson.

# UNITED STATES PATENT OFFICE.

JOHN A. ERICKSON, OF RUSH POINT, MINNESOTA.

## WATER-BICYCLE.

SPECIFICATION forming part of Letters Patent No. 642,683, dated February 6, 1900.

Application filed May 12, 1899. Serial No. 716,477. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. ERICKSON, a citizen of the United States, residing at Rush Point, in the county of Chisago and State of Minnesota, have invented certain new and useful Improvements in Water-Bicycles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in devices for traveling on the water and may be termed a "water-bicycle."

The object of my invention is to provide means by which a person may travel on the water while occupying the same position and using his hands and feet in the same manner as when riding a bicycle. This object I attain by the novel construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my complete water-bicycle. Fig. 2 is a top or plan view of Fig. 1 with the braces 12 and hood 13 omitted and the rear portion of the fender 42 cut away. Fig. 3 is a sectional front elevation on the line *a a* in Fig. 1. Fig. 4 is a sectional front elevation on the line *b b* in Fig. 1, showing such parts as are to be explained by said view; and Fig. 5 is a top view of a modification in the framework.

Referring to the various parts in the drawings by reference-numerals, 5 are two elongated floats or hollow bodies pointed at the ends and secured in parallel position by the front frame 6, having the braces 7 and 8, and the rear frame 9, having the braces 10 and 11. Said front and rear frames are secured together also by the braces 12 and the hood 13.

14 is a horizontal longitudinal central frame-bar secured to the front frame 6 by the braces 15 and to the rear frame 9 by the braces 10 (see Fig. 4) and has its free end bifurcated into two arms 16, in which is journaled the shaft 17, which carries, secured upon its ends, the two paddle-wheels 18, arranged with their paddles alternately opposite the spaces between the paddles on the other wheel. Upon

said shaft 17 is further secured between the arms 16 a chain-wheel 19, which is driven by the chain 20, and the chain-wheel 21, shielded by the hood 13 and secured on the pedal-shaft 22, which is journaled in the outwardly-offset portions 23 of the frame-bar 14, so that the chain-wheel 21 is located in the space 24 between the offsets.

Upon the frame 9 is secured the rider's seat 25, and in the front frame 6 is journaled the upright steering-shaft or handle-bar 26, provided with the bicycle-handles 27 at its upper end and at its lower end with the arms 28, from which extend, through suitable guides 29 30, two ropes or light chains 31 and 32, which have their rear ends secured to the arms 33 of the rudders 34, hinged one at each rear end of the floats 5.

It will be easily understood that in operation the rider sits on the seat 25 and operates the pedals 22 the same as on a bicycle, and by turning, with his hands resting on the handles 27, the shaft 26 the chains 31 32 operate the rudders 34 simultaneously to either side, so as to steer the craft in the water, the surface of which is indicated by the line 35.

The steering-chains 31 32 may work through plain guides, like 29, or guides containing sheaves, as 36 37, in the guide 29<sup>x</sup> in Fig. 3.

It is evident that the device may be supplied with seats and pedals for several persons, the same as in tandem bicycles, and when the machine is thus made or if it otherwise is desired to facilitate the shipping thereby the floats are each made in two sections separable at the line 38 and provided with permanent bottoms or closing-walls 39, so that the sections need only be secured together by the plates 40 and screws 41. Said plates 40 may be made integral with one or both of the frames 6 and 9.

42 is a shield or fender secured to the frame 9 and steadied by the braces 43 to protect the rider from the water thrown by the paddle-wheel.

In Fig. 5 the bar 14 is swinging on the hubs 50, allowing vertical adjustment of the paddle-wheel by the hand-lever 51, latch 52, and notched sector 53.

The floats may be made of tin, sheet-iron, or other suitable materials.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

In a device of the class described, the combination with the parallel elongated floats 5 and steering means for same, of the frames 6 and 9 securing the floats together and carrying the steering-handles and shaft and the seat 25; the braces 12 and hood 13 suspended from the frames 6 and 9; the longitudinal frame-bar 14, secured to the frames 6 and 9; and having the slot 24 and the forked rear end 16, extending rearwardly beyond the frame 9, the shaft 17 journaled in the said fork 16, and carrying inside the fork a chain-wheel secured to it, and at both ends paddle-

wheels set with their paddles in alternate positions one to another; a pedal-shaft journaled in the framework and having at its middle secured on it the chain-wheel 21 in the slot 24, and an endless chain passing under and over the frame-bar 14, and connecting the two chain-wheels, substantially as and for the purpose forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN A. ERICKSON.

Witnesses:

A. M. CARLSEN,  
J. P. ALLEN.



No. 645,807.

Patented Mar. 20, 1900.

H. D. GUFFEY.  
BOAT PROPELLER.

(Application filed July 5, 1899.)

(No Model.)

2 Sheets—Sheet 1.

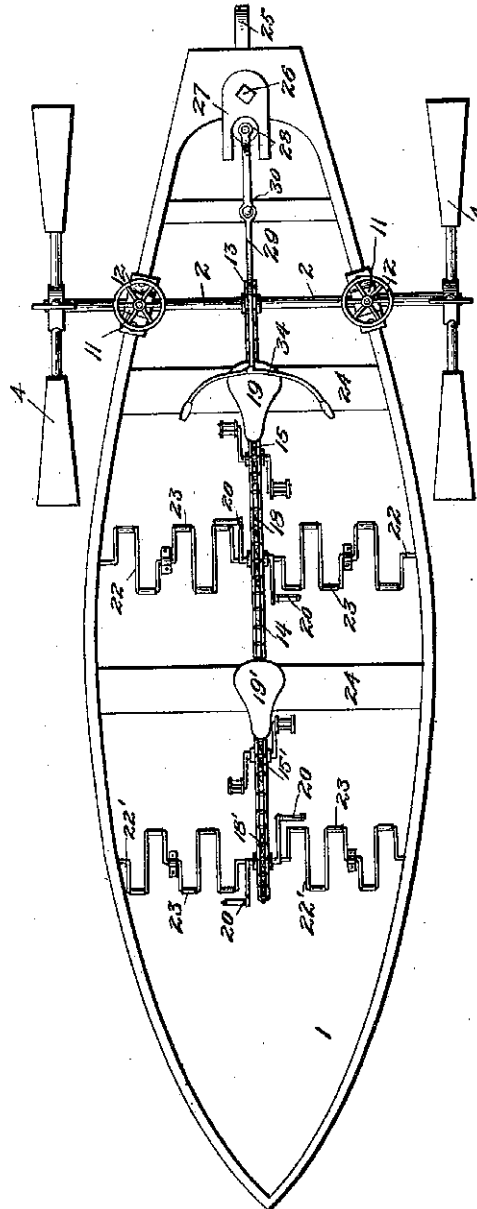


Fig. 1.

Witnesses  
*E. B. Hunt*  
*Carlson*

Inventor  
*H. D. Guffey*  
*H. B. Watson*  
Attorneys

No. 645,807.

Patented Mar. 20, 1900.

H. D. GUFFEY.  
BOAT PROPELLER.

(Application filed July 5, 1899.)

(No Model.)

2 Sheets—Sheet 2.

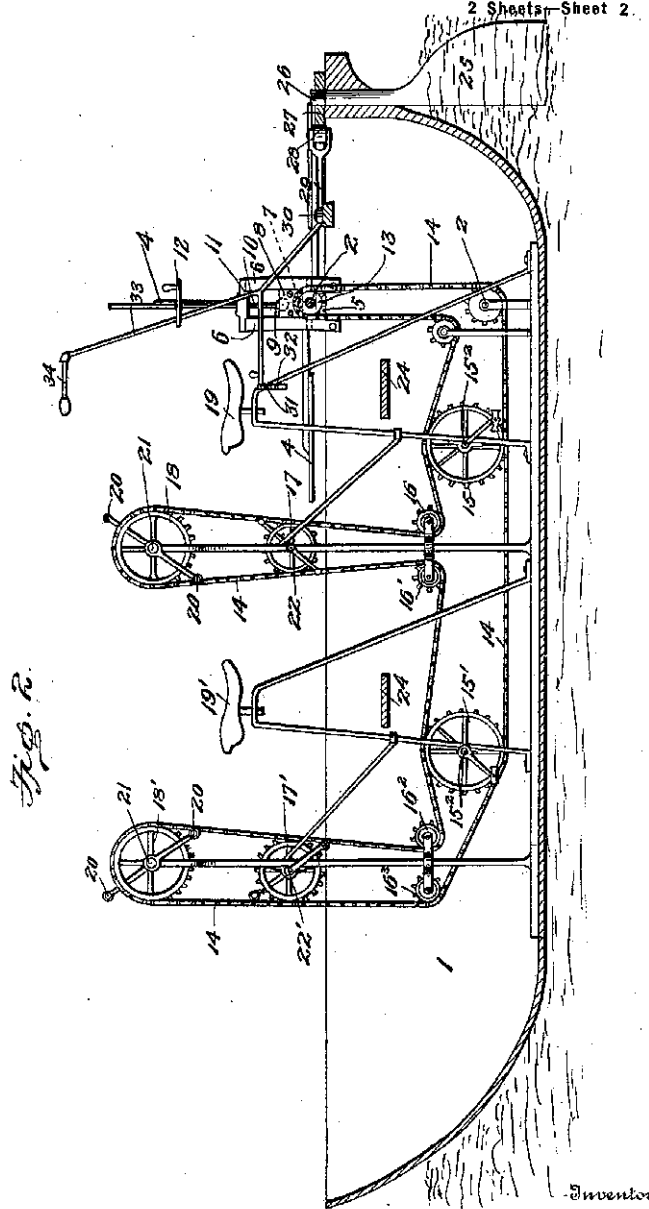


Fig. 2.

Witnesses  
*Edmund  
Gawellson*

Inventor  
*H. D. Guffey*  
by *A. B. Wilson & Co*  
Attorneys

# UNITED STATES PATENT OFFICE.

HAMILTON DAVIS GUFFEY, OF ELKO, MISSOURI.

## BOAT-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 645,807, dated March 20, 1900.

Application filed July 5, 1899. Serial No. 722,831. (No model.)

*To all whom it may concern:*

Be it known that I, HAMILTON DAVIS GUFFEY, a citizen of the United States, residing at Elko, in the county of Putnam and State of Missouri, have invented certain new and useful Improvements in Boat-Propellers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to boat-propellers, and more particularly to that class in which the paddle-wheels are rotated by a system of sprocket wheel and chain gearing operated by hand and foot levers somewhat analogous to that employed on bicycles.

The object of the invention is to provide a simple, effective, and convenient device for this purpose.

To this end the invention consists in certain features of construction and combination of parts, which will be hereinafter more fully described and claimed.

In the accompanying drawings the same reference characters indicate the same parts of the invention.

Figure 1 is a top plan view of a boat provided with my improved propelling mechanism. Fig. 2 is a side elevation, partly in section, of the same.

1 denotes the boat, which may be of any suitable size, shape, and draft to correspond to the waters in which it is used.

2 designates the paddle-wheel shaft, on the ends of which are fixed paddle-wheels 4 4, which may be of any approved form to correspond to the boat or vessel. This shaft has a bearing in the pillow-blocks 5 5, which have a sliding engagement with the frame 6 6, and the upper end of each block is formed with a knob 7, encompassed by a clamp 8, which also encompasses a similar knob 9, formed on the lower end of an elevating-screw 10, having a threaded engagement with a cross-bar 11 of the frame 6 6. The upper ends of these elevating-screws 10 10 terminate in the hand-wheels 12 12, by means of which the shaft 2 may be raised or lowered to increase or diminish the dip of the wheels or raise them out of the water, as occasion requires.

13 denotes a sprocket-wheel fixed on the paddle-shaft, and 14 a sprocket-chain encom-

passing the same, the upper member of which passes over a pedal-gear 15, thence under an idler 16, thence engaging one side of the sprocket-wheel 17, and oversprocket 18 downward, engaging the opposite side of the wheel 17, and under the idler 16', thence horizontally forward, engaging the upper edge of the pedal-sprocket 15', thence under the idler 16" and vertically upward, engaging the rear edge of the sprocket 17', thence around the sprocket 18' and downward, engaging the forward edge of the sprocket 17', and around the idler 16" and horizontally rearward, engaging the lower edges of the pedal-gears 15' and 15, to the starting-point.

The sprocket-gears 15 15' are each mounted on a crank-shaft 15", provided with the usual pedals propelled by riders on the saddle-seats 19 19', who also manipulate the crank-handles 20 20 on the crank-shafts 21 21, carrying the sprocket-wheels 18 18'.

22 22' denote multiple crank-shafts journaled in suitable bearings and provided with loose hand-grips 23, which may be conveniently reached by persons on the fixed seats 24 24 to assist in propelling the craft.

25 denotes the rudder, the post 26 of which is provided with a bifurcated tiller 27 to receive the friction-roller 28 on the rear arm of the steering-lever 29, fulcrumed on the bolt 30, and its forward end terminates in a toe 31, which has a spring engagement with a notched rack 32, arranged in the rear of the seat 19 and within convenient reach of the person occupying said seat.

An auxiliary arm 33 extends upward and forward from the steering-lever, and it terminates in a horizontally-curved brace or bracket 34, which forms a back-rest for the rider on the rear seat and which also enables him to steer the boat without the use of his hands, for by pressing the rest 34 upward with his back the toe 31 is lifted out of the rack 32, and the rider by swaying his body to the right or left causes the rudder to alter the course of the boat.

I do not herein claim the steering mechanism, as that will form the subject-matter of a separate application.

The accompanying drawings show my invention in the best form now known to me; but many changes in the details might be



made within the skill of a good mechanic without departing from the spirit of my invention as set forth in the claim at the end of this specification.

5 Having thus fully described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

10 The combination with the boat, the pillow-blocks, 5 5, formed with the knobs, 7 7, the elevating-screws, 10 10, mounted in stationary blocks fixed to the boat, the clamps, 8 8, connecting the pillow-block knobs, and elevating-screws, the paddle-wheel shaft journaled in said pillow-blocks, a sprocket-wheel

fixed on said shaft, a series of crank-shafts 15 and sprocket-wheels, and an endless sprocket-chain connecting said wheels, hand and foot cranks fixed to said wheels and adapted to impart a rotary motion to said paddle-wheel shaft, substantially as and for the purpose set 20 forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HAMILTON DAVIS GUFFEY.

Witnesses:

JOHN A. HELFERSTINE,  
NEAL B. MARSHALL.

No. 655,742.

Patented Aug. 14, 1900.

D. R. SHEEN.

PROPELLING MECHANISM FOR BOATS.

(Application filed Sept. 5, 1899.)

(No Model.)

Fig. 1.

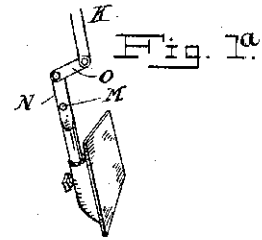
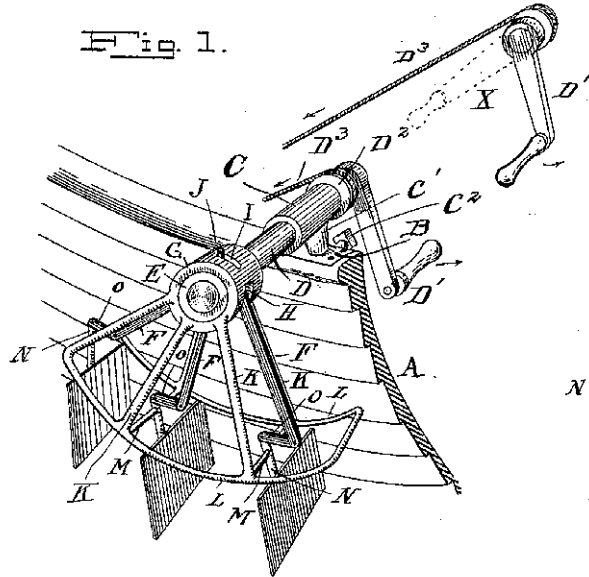


Fig. 2.

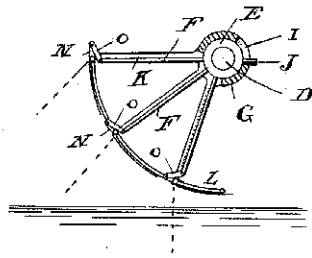


Fig. 3.

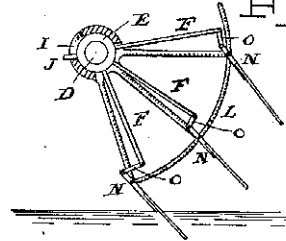


Fig. 4.

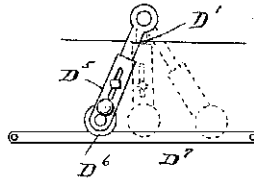
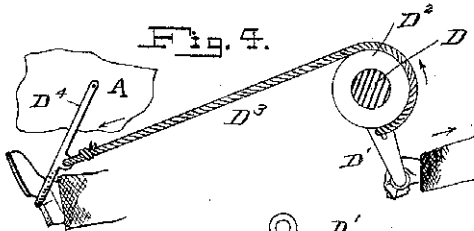


Fig. 5.

WITNESSES -  
E. Johnson  
H. Andrew

INVENTOR  
Daniel R. Sheen  
By I. M. Thurston,  
ATTY.

# UNITED STATES PATENT OFFICE.

DANIEL R. SHEEN, OF PEORIA, ILLINOIS.

## PROPELLING MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 655,742, dated August 14, 1900.

Application filed September 5, 1899. Serial No. 729,423. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL R. SHEEN, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have  
5 invented certain new and useful Improvements in Propelling Mechanism for Boats and Sleds; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled  
10 in the art to which it appertains to make and use the same.

This invention pertains to propelling devices for boats, but it may be used for propelling sleds on ice or snow as well.

15 One object of the invention is to provide an improved paddle mechanism that can be used on boats in all weathers.

A further object is to provide paddles adapted to be folded after each stroke, so  
20 that no wind-surfing is necessitated.

movement of the sleeve on said hub. A slot I in said sleeve and a pin J in the hub limit the movements of such hub and sleeve and  
55 are also instrumental in opening and closing the paddles, as will appear hereinafter. The sleeve has a series of arms K at each end parallel with the spokes P. These are connected by rims L, concentric with the sleeve.  
60 Between the arms at the rim are horizontal bars M, acting as pivots for paddle-arms N, and the upper ends of the arms are connected by links O to the free ends of the spokes P, as shown. The inner end of the shaft D is  
65 provided with a crank D', and a drum D<sup>2</sup>, the latter having a rope or strap D<sup>3</sup> wound around it. The opposite end of the rope is attached to a foot-lever D<sup>4</sup>, Fig. 4, pivoted to the inside of the boat. In Fig. 5 the crank  
70 D' is provided with a sleeve D<sup>5</sup>, carrying a wheel C, secured to the shaft D.

the end of the slot I, carrying the outer arrangement forward bodily. It is evident that the slot and pin just mentioned are not absolutely necessary to the proper working of the device but I provide them in order to make the operation certain. It is observed that I have by this arrangement provided a bow-facing propelling mechanism, and, furthermore, I have provided a propelling mechanism that is more easily operated than any of which I am aware, since the best position for applying the power is obtained by placing the cranks below the center of the shaft and moving them only a portion of a revolution at the most advantageous position. By the construction shown in Fig. 5 I am enabled to move the crank-handle in a straight line by means of the guide D', as well as to have the leverage nearly uniform at all positions. The said guide may be slanted in either direction or may be curved, as best suited to the wants of the user. I may dispense with the foot-lever entirely; but I find it an aid to rowing, and hence prefer to use it. By closing the paddles all wind-surface is avoided. The drawings show the paddle-frame made in a quarter-circle; but I may employ a semicircular one or longer, if needed, and employ a greater or less number of the paddles. Heretofore paddle-wheels have been employed on pleasure-boats, and an entire revolution thereof was necessary; but the operator had only one advantageous point in the entire revolution where he could exert the most power, and that was when the crank was being drawn toward him. The speed gained at that moment was lost in the remainder of the cycle. Now by providing my device I am enabled to put all power into the stroke, the same as in rowing with oars, and return immediately to the starting-point for another stroke without loss of speed. While the drawings show only one propeller on the boat, Fig. 1, at the left side, it is understood that one on the right side is employed also. One device may be operated independent of the other in order to steer or turn the boat around in any desired direction.

Having thus described my invention, I claim—

1. In a propelling mechanism for boats, a horizontal shaft having bearing on the gunwale thereof, a series of spokes secured to the shaft at right angles thereto, a series of paddles adapted to open and close, supports for the paddles, loose connections between the paddles and the spokes for opening and closing the former, as described, and means for imparting an oscillatory movement to the shaft whereby the paddles are swung concentric to the shaft, as set forth, and closed when out of the water but opened when immersed.

2. In a propelling mechanism for boats the combination with a bearing supported on the gunwale, a shaft held in such bearing and adapted to oscillate therein, a hub on the outer end of the shaft, spokes on said hub, a

sleeve on the hub and having the spokes projecting therethrough, arms on the sleeve substantially parallel with the spokes on the hub, pivots between the arms, paddles supported on the pivots and links connecting the paddles and spokes as and for the purposes described and means for imparting an oscillatory movement to the shaft substantially as specified.

3. In a propelling mechanism for boats the combination with an adjustable bearing on the gunwale, a shaft for such bearing and adapted to oscillate therein, a crank and drum on the inner end of the shaft, the former having a rope or strap wound thereon, a foot-lever pivoted on the boat and having the said rope, or strap, attached thereto, a hub on the outer end of the shaft, spokes on the hub, a sleeve on the hub and having the spokes projecting therethrough, arms on the sleeve substantially parallel with the spokes on the hub, pivots between the arms, paddles supported on the pivots and links connecting the paddles and spokes as and for the purposes described and means for imparting an oscillatory movement to the shaft substantially as specified.

4. In a propelling mechanism for boats, a shaft mounted on the gunwale, bearing for the same, adjustable for height, a crank and drum on the inner end of the shaft, a rope, or strap, wound on the drum for the purposes set forth, a foot-lever for the said rope or strap, a hub on the outer end of the shaft, a pin therein, a sleeve on the hub, a slot in the sleeve for the pin, spokes on the hub, a slot in the sleeve for the passage of the spokes, arms on the sleeve, paddles pivoted between the arms, links between the spokes and paddles, the latter adapted to be opened and closed by the shifting movement of the spokes substantially as and for the purposes set forth and described.

5. The combination with a boat-rowing mechanism constructed substantially as shown, of a guide D' secured to the inside of the boat, a crank for operating the said rowing mechanism, a sleeve adapted to slide thereon, means for limiting the movement of the sleeve, a wheel on the free end of such sleeve for engaging the guide and a handle for operating the crank substantially as shown.

6. In a boat-propelling mechanism the combination of adjustable paddles therefor, spokes for operating them, a wheel-section for supporting them, means for adjusting same for any height, all being arranged so that a forward movement of the said paddles and their operating parts, together with the reversed movement thereof, will collapse said paddles to a position substantially at right angles to the open or working position, and, by the backward movement such paddles will, by their momentum and the reversing movement, open into position for work, a shaft for carrying all the parts named, a crank on the shaft for hand use, a lever on

the boat for foot-power, a drum on the shaft, flexible connection between the drum and foot-lever for assisting the hand-power, both the foot and hand powers combining to produce an oscillatory or partially-rotary movement of the shaft and paddles in an arc of a circle such are lying in the lowest portion of that circle whereby the greatest power is exerted by the operator in drawing the crank toward him substantially as and for the purposes specified.

7. In a boat-rowing mechanism, the combination with the bearing C secured to the gunwale of the boat, the shaft D revolubly mounted thereon, a crank D' for operating it the same being operated inside the boat, a hub E secured to the outer end of the shaft, arms F secured thereto, a sleeve G surrounding the hub, a slot therein for the passage of the said arms F, a slot I in said sleeve, a pin J in the hub adapted to pass through the said slot, a series of arms K on the sleeve and carrying the rims L, paddle-arms M pivoted between the rims, links O connecting the said paddle-arms and said arms F all arranged for the purposes set forth.

8. In a boat-rowing mechanism, the combination with the bearing C secured to the

gunwale of the boat, the shaft D revolubly mounted thereon, a crank D' for operating it, the same being operated inside the boat, a hub E secured to the outer end of the shaft, arms F secured thereon, a sleeve G surrounding the hub, a slot therein for the passage of the said arms F, a slot I in said sleeve, a pin J in the hub adapted to pass through said slot, a series of arms K on the sleeve carrying the rims L, paddle-arms K pivoted between them, links O connecting the said paddle-arms and said arms F, a drum D<sup>2</sup> secured to the shaft within the boat, a foot-lever D<sup>4</sup> pivoted to the side of the boat and flexible means attached to said lever at one end, and surrounding the said drum D<sup>2</sup> at the other, whereby a movement of the said crank D<sup>2</sup> in one direction will wind the said flexible means upon the drum and a movement of the lever, by the foot, will unwind the same in propelling the boat, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL R. SHEEN.

Witnesses:

C. JOHNSON,

W. C. ANDREW.

No. 659,841.

Patented Oct. 16, 1900.

A. BELZ.

PROPELLING MECHANISM FOR BOATS.

[Application filed Feb. 15, 1900.]

(No Model.)

Fig. 1.

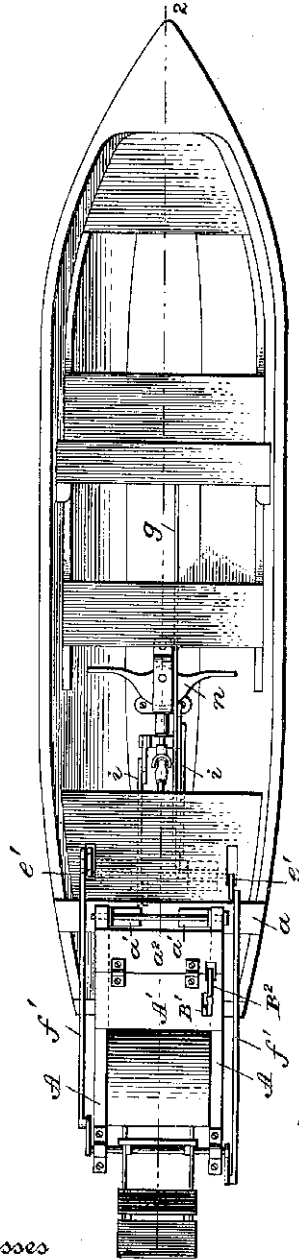


Fig. 2.

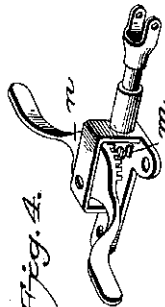
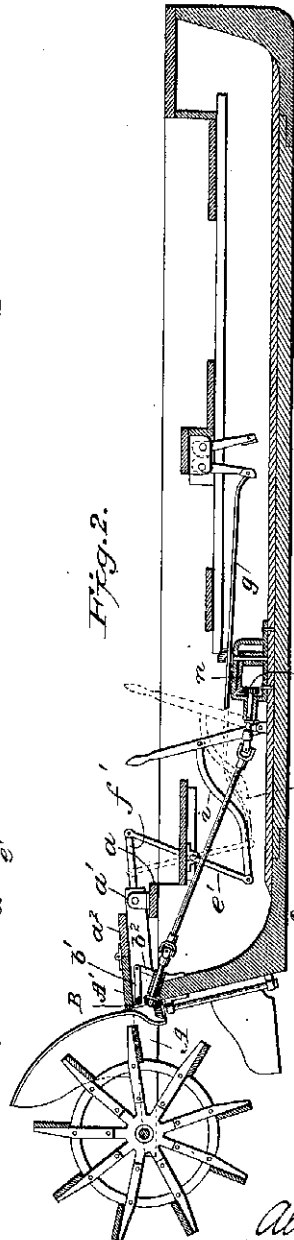


Fig. 4.

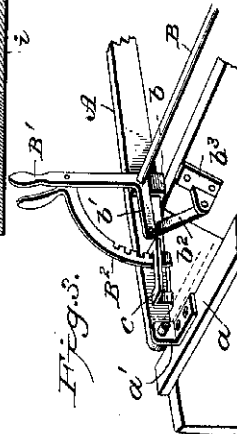


Fig. 3.

Witnesses  
L. S. Elliott.  
H. H. Johnson.

Inventor  
Albert Belz-  
by Eugene H. Johnson  
his Attorney.

# UNITED STATES PATENT OFFICE.

ALBERT BELZ, OF APPLETON, WISCONSIN, ASSIGNOR TO THE APPLETON  
BOAT PROPULSION MANUFACTURING COMPANY, OF SAME PLACE.

## PROPELLING MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 659,841, dated October 16, 1900.

Application filed February 15, 1900. Serial No. 5,273. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT BELZ, a citizen of the United States, residing at Appleton, in the county of Outagamie and State of Wisconsin, have invented new and useful Improvements in Propulsion Mechanism for Boats, of which the following is a specification.

This invention relates to improvements in propulsion mechanism for boats, the object being to provide improved mechanism for raising and lowering the carrying-frame and stern-wheel, so that said frame and wheel may be locked in the position in which they have been placed.

The invention also consists in the construction and combination of the wheel-driving mechanism whereby one person can actuate the hand-levers to drive the wheel and without taking his hands off the levers, the mechanism being so arranged that other persons may assist in driving the wheel by operating foot-levers of the type shown in Patent No. 618,555, issued to me January 31, 1899.

The invention also consists in the construction and combination of the parts and general arrangement thereof, as will be hereinafter set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a boat having my improvements applied thereto. Fig. 2 is a longitudinal sectional view taken on the line 2-2 of Fig. 1. Fig. 3 is a detail perspective view of the mechanism for raising and lowering the frame to which the stern paddle-wheel is attached, and Fig. 4 is a detail perspective view of the foot-gear of the steering mechanism.

The boat near its stern is provided with a cross-piece *a*, which is provided with brackets *a'*, through which passes a bar or rod which pivotally attaches thereto the side bars *A* of the stern-wheel-supporting frame. These side bars are connected to each other by a board *A'*, to which is hinged a board *a''*, and rear of the board *a'* is a guard or fender, constructed as shown in my prior patent.

The stern-wheel is journaled upon the side bars *A*, and the supporting-shaft thereof has arms or cranks to which are attached rods which connect the cranks to levers.

To the side bars *A* by means of suitable

brackets *b* there is secured a shaft *B*, which shaft lies between the side bars *A* and beneath the transverse board which is attached to the upper sides of the bars. The shaft *B* is provided with arms *b'*, to which are attached links *b''*, these links being pivotally attached at their lower ends to brackets or fixtures *b'''*, which are secured to the stern of the boat. Adjacent to one of the arms the rod or shaft is provided with a lever *B'*, said lever projecting through a slot in the board *A'*, and to said lever there is pivotally attached a notched or toothed segment *B''*, which has above its pivot a hand-grasping portion. The segment *B''* passes through an opening preferably adjacent to the abutting edges of the board *A'* and *a''* and is adapted to engage with a catch-plate *c*, secured to one of the side bars *A*. The catch-plate *c* is preferably made from a flat plate of metal bent so that the ends will project in opposite directions, the lower end or side having perforations through which pass the means for attaching the plate to the under side of one of the bars *A*.

By means of the construction shown when the hand-grasping portion of the segment is brought toward the lever said segment will be thrown out of engagement with the catch-plate, and by drawing the upper end of the lever forward the paddle-wheel-supporting frame may be raised, and when the segment is released it will engage with the catch-plate and hold the frame against movement. To lower the frame, it is only necessary to release the segment, when the frame will be lowered, so as to rest upon the stern cross-bar of the boat.

The construction shown provides a convenient means for raising and lowering the paddle-wheel, so that it can be lifted entirely out of the water or positioned so that the paddles will be submerged to the desired depth in accord with the load in the boat or the number of persons assisting in the propulsion of the same.

The rods *f'*, which extend forward from the cranks of the paddle-wheel, are attached to the upper ends of levers *e'*, which are journaled beneath the rear or stern seat of the boat, and to the lower ends of said levers are attached connecting-rods *i*, which are pivot-

ally attached to hand-levers, said hand-levers being secured to a bracket attached to the floor of the boat in line with its keel, so that the hand-levers will project upward from the center of the boat. One of the lower ends of the levers *e'* is provided with an inwardly-projecting pin, with which a rod *g* may be placed in engagement, said rod extending forward for engagement with foot-levers, which are attached to cross-pieces in rear of the seats. The foot-levers and their connecting mechanism may be as shown in my prior patent, and when the rod *g* is placed in engagement with one of the levers *e'* a person sitting on one of the forward seats can by actuating the foot-levers assist in propelling the boat, the hand-levers being operated by a person sitting on the rear seat.

In order to provide a convenient steering-gear which can be operated by the person who manipulates the hand-levers, I attach to the bottom board of the boat a frame which supports a short section of shafting, upon which is mounted a gear-wheel *m*, and with said gear-wheel there meshes depending teeth of a fixture *n*, which is pivoted to the frame and is provided with lateral and upwardly-extending foot-rests. To the short section of shafting which passes through a sleeve of the rigidly-attached fixture there is attached a part of a universal joint, from which extends upwardly and rearwardly a shaft having at its ends parts of a universal joint, the upper end engaging with a short and suitably-housed shaft, which has a pinion, said pinion engaging with a pinion on the rudder-head. By this construction when the footpiece is moved the rudder will be turned.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a propulsion mechanism for boats, the combination with a stern-wheel-supporting frame which is pivotally attached at its forward end to the hull of a boat, of a hand-lever connected to the supporting-frame and to the hull of the boat, and means for locking the hand-lever to prevent the raising or lowering of the wheel-supporting frame.

2. In a propulsion mechanism for boats, the combination with a wheel-supporting frame which is pivotally attached to the hull of a boat, a hand-lever pivotally attached to the supporting-frame and provided with a forwardly-projecting arm, a link connected to said arm and to the hull of the boat, and means for locking the lever to prevent movement of the frame, substantially as shown.

3. In a propulsion mechanism for boats, the combination with a supporting-frame for a stern-wheel, means for movably connecting the frame with the hull of a boat, a cross-bar or shaft carried by the frame and provided with forwardly-projecting arms, a lever for actuating the shaft and arms, links pivoted to the arms and to brackets which are secured to the hull of the boat, a segmental locking-plate pivoted to the operating-lever and adapted to engage with a catch-plate carried by the wheel-supporting frame, substantially as shown and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALBERT BELZ.

Witnesses:

ALBERT BELZ, Jr.,  
J. A. JOHNSON.





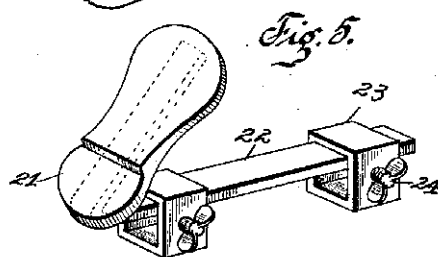
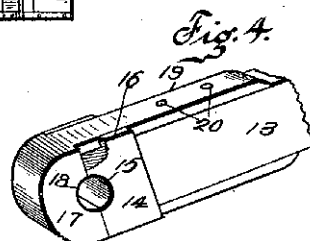
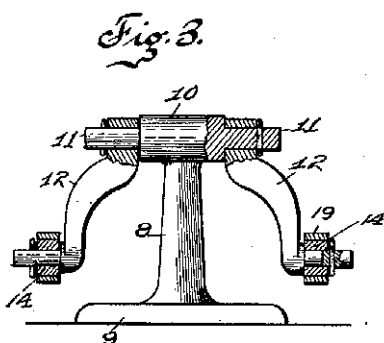
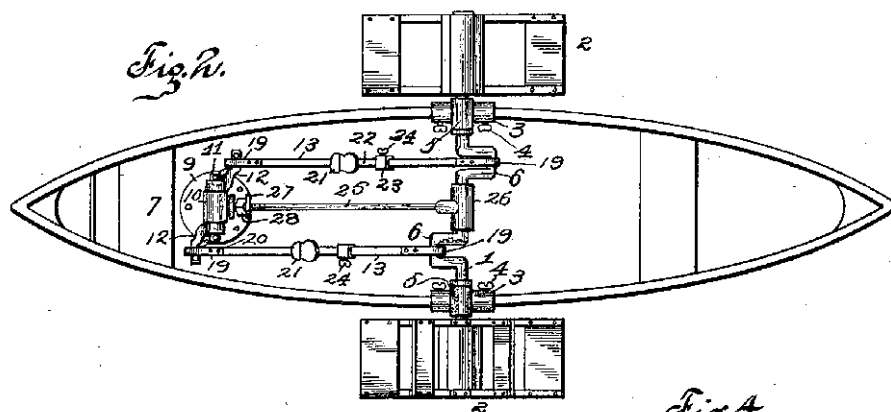
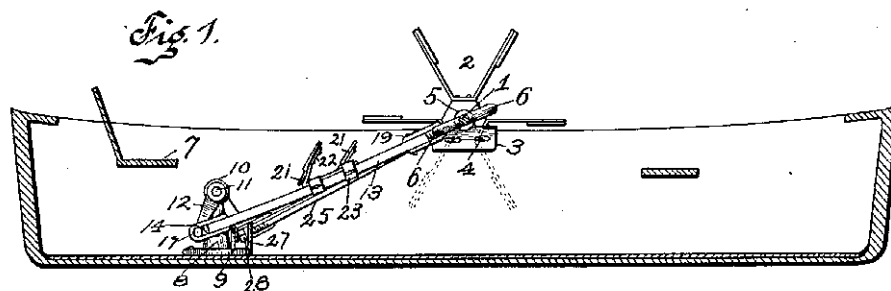
No. 669,294.

Patented Mar. 5, 1901.

F. WELLER.  
PROPELLING APPARATUS.

(Application filed Oct. 15, 1900.)

(No Model.)



Witnesses  
Alfred A. Eicher  
J. D. Rippey.

Inventor  
Frank Weller  
By Higdon & Longan, Attys

# UNITED STATES PATENT OFFICE.

FRANK WELLER, OF ST. LOUIS, MISSOURI.

## PROPELLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 669,294, dated March 5, 1901.

Application filed October 15, 1900. Serial No. 33,123. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK WELLER, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in a Propelling Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to a propelling apparatus; and it consists of the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a longitudinal sectional view of a boat, showing my improved propelling device secured thereto. Fig. 2 is a plan view of the boat. Fig. 3 is a view of a post and cranks which constitute a part of my invention. Fig. 4 is a perspective view showing one end of a rod made use of in carrying out the invention. Fig. 5 is a perspective view of a footpiece and fastening device whereby

each end of the rods 13 is a block 14, provided in its outer face with a semicircular notch 15, adapted to receive a portion of the crank to which that end of the rod is adapted to be secured. The sides of the block 14 are provided with the ears 16, the purpose of which will presently appear.

17 indicates the outer block, formed in the inner side of which is a recess 18, conforming to the recess 15, and integral with the sides of the block 17 are the projections 19, which, as shown, inclose the ends of the rods 13 and rest between the ears 16 of the block 14. Screws or other fastening devices 20 serve to hold these parts in position and to retain the rods in the required adjustment connecting the cranks 6 and 12.

Secured to each of the rods 13 is a suitable treadle whereby the said rods may be operated to rotate the shaft 1, and thereby the paddle-wheels 2, to propel the boat. The said treadles consist of the foot pieces 21, of ordi-

as manifest, the direction in which the boat is propelled may be regulated at will.

When it is not desired to retain the propelling device on the boat, it may be easily and quickly removed by detaching the members 3 and removing the cranks 12 from their supports, thereby allowing all the parts described to be removed except the vertical post 8, which occupies very little space within the boat and which may also be removed, if desired.

I claim—

1. A propelling device consisting of a shaft carrying paddle-wheels, cranks formed integral with said shaft, treadle-rods pivotally attached to said cranks, treadles upon said treadle-rods, means for adjusting the treadles in different positions upon the treadle-rods,

and means for holding them rigidly in the different adjustments.

2. A propelling device for boats, consisting of a crank-shaft carrying paddle-wheels, means for attaching the crank-shaft to the boat, a post mounted in the bottom of the boat and carrying cranks on its upper end, treadle-rods connecting the said cranks and the crank-shaft, treadles carried by said rods, and means for adjusting the said treadles in different positions on the rods, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK WELLER.

Witnesses:

ALFRED A. EICKS,  
J. D. RIPPEY.



No. 674,901.

Patented May 28, 1901.

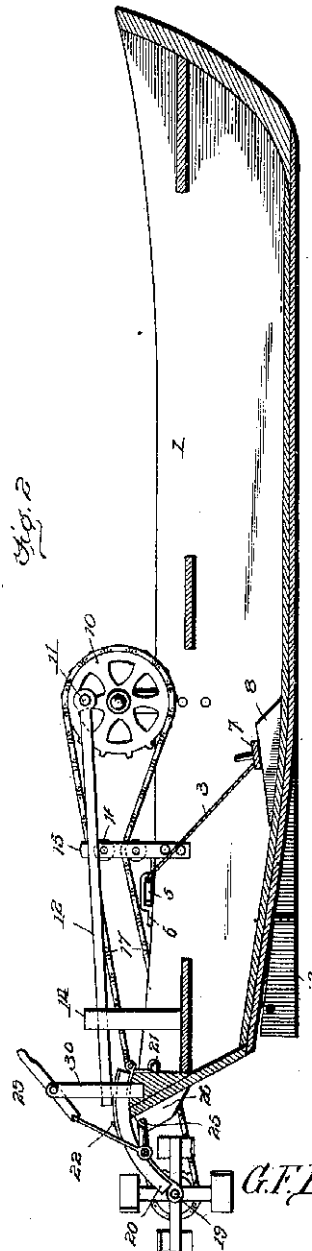
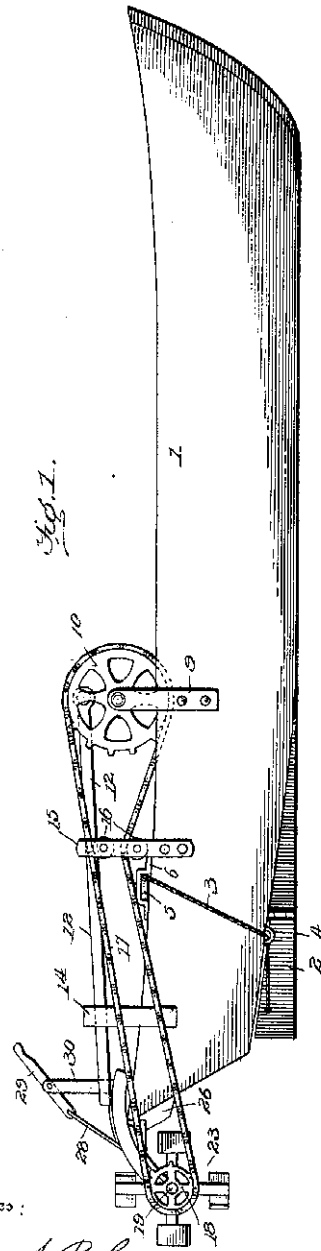
G. F. BRYAN.

### PROPELLING MECHANISM FOR BOATS.

(No Model.)

(Application filed Nov. 5, 1900.)

2 Sheets—Sheet 1.



Witnesses :

Harry S. Robins.  
Herbert D. Lawson

Inventor

G. F. Bryan.

334

Victor J. Evans.

Attorney

No. 674,901.

Patented May 28, 1901.

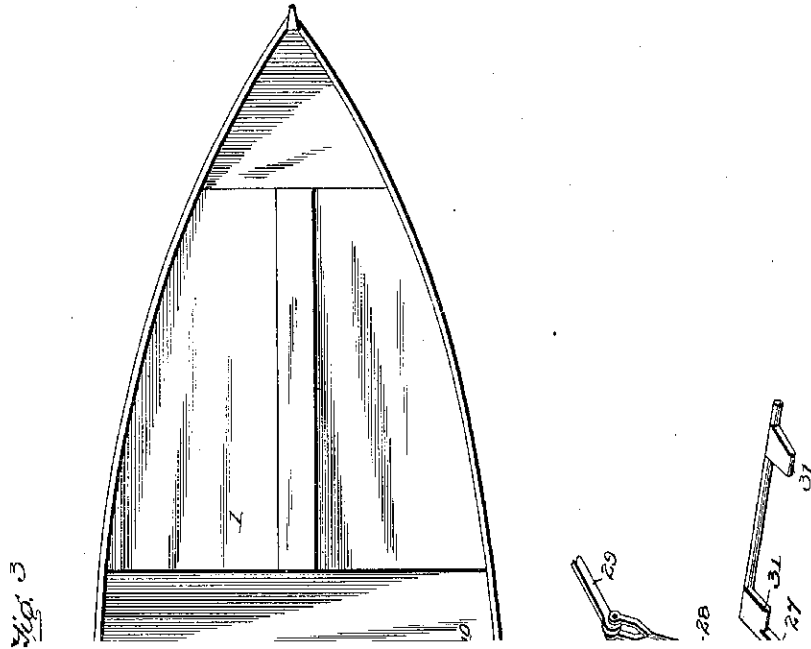
G. F. BRYAN.

PROPELLING MECHANISM FOR BOATS.

(Application filed Nov. 5, 1900.)

(No Model.)

2 Sheets—Sheet 2.



# UNITED STATES PATENT OFFICE.

GEORGE F. BRYAN, OF MEGGETT, SOUTH CAROLINA.

## PROPELLING MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 674,901, dated May 28, 1901.

Application filed November 5, 1900. Serial No. 35,551. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. BRYAN, a citizen of the United States, residing at Meggett, in the county of Colleton and State of South Carolina, have invented certain new and useful Improvements in Propelling Mechanism for Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in propelling mechanism for boats; and its primary object is to provide a device the propellers of which may be readily adjusted from or toward the water and which are provided with means whereby they may be readily revolved by a person sitting within the boat to which the mechanism is attached.

A further object is to provide means of novel construction whereby the boat may be readily steered.

With these and other objects in view the invention consists in providing sprockets which are mounted at each side of the boat and to which are pivoted horizontal strips having suitably - arranged grips thereon. These sprockets are engaged by chains which pass back to shafts supported upon frames which are hinged to the stern of the boat. Means are provided whereby these shafts may be raised from the water in unison. Said shafts are so mounted that the same may be operated independently of each other.

The invention also consists in certain novel features of construction and combination of parts, which will be hereinafter fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is a side elevation of the device. Fig. 2 is a longitudinal section. Fig. 3 is a plan view. Fig. 4 is a detail view of the means for lifting the propellers and their frames.

Referring to the figures of the drawings by numerals of reference, 1 is a boat having a rudder 2, to opposite sides of which are connected ropes or cables 3. These ropes pass through suitably-disposed eyes 4, arranged upon the bottom of the boat, and over pulleys

5, mounted within brackets 6, which are secured to the gunwales of the boat. The remaining ends of these ropes are secured at the opposite ends of a strip 7, which is pivoted at its center upon an inclined block 8, fastened within the boat at the bottom thereof. It will be seen that by this construction the rudder may be readily turned in either direction by swinging the strip 7 upon its pivot. This strip is so located that the same may be readily operated by the foot of a person sitting within the boat.

A standard 9 is secured to each side of the boat, and journaled upon the inner face thereof is a sprocket 10, having a wrist-pin 11, upon which is mounted the end of a sliding rod 12. The free end of this rod is supported by and slidable within a slot 13, formed within the top of a standard 14, secured to the side of the boat adjacent to the stern.

A standard 15 is secured to the boat at a point between each of the standards 9 and 14 before referred to, and within each standard 15 are journaled rollers or pulleys 16, which are arranged one above the other. These pulleys are adapted to support a chain 17, which is mounted upon and engages the sprocket 10 and a preferably smaller sprocket 18, which is secured to a shaft 19, arranged transversely of the boat in rear thereof. This shaft is journaled within the outer ends of strips 20, the opposite ends of which are extended over the stern of the boat and are hinged thereto, as shown at 21. It will be understood that two shafts 19 are employed, one for each of the sprockets 10, and these shafts are of such length as to extend from points adjacent to the sides of the boat to a point approximately in alinement with the center thereof. As before stated, preferably two strips 20 are provided for each shaft, and these strips are securely held in proper relation to each other in any suitable manner, as by means of braces 22.

A paddle-wheel or propeller 23 is secured to each shaft 19 at a point between its supporting-strips 20, and a hook 24 or other suitable securing means is provided, whereby the supports of the two shafts may be locked together when desired.

A shaft 25 is journaled within brackets 26, which are secured to the stern, and a crank



27 is arranged, preferably, at the center of this shaft, said crank being connected by means of a link 28 with a lever 29, which is pivoted upon a standard 30, extending upward from the stern at the center thereof. Studs or plates 31 extend from the shaft 25 in alinement with the crank 27 thereof, and these plates are so arranged as to lie one beneath each of the supporting-strips 20. It will thus be seen that when the lever 29 is depressed the plates 31 will swing upward and contact with the supporting-strips 20 and raise them, thereby lifting the propellers 23 therewith.

A grip or handle 32 extends inward from each of the sliding strips 12, and both of them are placed in close proximity to the seat occupied by the person propelling the boat.

When it is desired to operate the device, the operator places his feet upon the pivoted strip 7 and sits in such a position that the grips 32 may be readily grasped. Said grips are then moved back and forth, and rotary motion is thus imparted to the sprockets 10. This motion will be transmitted, through the chains 17, to the two small sprockets 18, secured to the propeller-shafts 19. Said propellers will thus be revolved within the water.

When it is desired to steer the boat, it is merely necessary to swing the strip 7 in the proper direction upon its pivot, or, if desired, one of the propellers may be stopped while the operation of the remaining one is continued.

When for any reason it is desired to raise the propellers to points nearer the surface of the water, it is merely necessary to swing the lever 29 downward upon its pivot. This will cause the plates 31 to contact with the supporting-strips 20 and move the same upward. Any suitable means may be provided for locking the lever in the position to which it is moved. For instance, an ordinary toothed segment and pawl may be employed for this purpose. If desired, the hook 24 may be detached from one of the supporting-strips 20, and both of the propeller-shafts and their frames may then be swung upward out of the water forward into the boat.

By providing pulleys or rollers 16 within the standards 15 the chains 17 are so arranged as to have a tendency to swing the propellers and their frames downward into the water instead of upward therefrom. Moreover, said

rollers permit the chains to move easily and smoothly.

In the foregoing description I have embodied the preferred form of my invention; but I do not wish to be understood as limiting myself thereto, as I am aware that modifications may be made therein without departing from the principle or sacrificing any of the advantages thereof, and I therefore reserve to myself the right to make such changes as fairly fall within the scope of my invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. The combination with a boat; of a frame hinged thereto, a shaft journaled within the frame, a propeller secured to said shaft, a sprocket mounted upon the boat, a sliding strip secured at one of its ends to the sprocket, a sprocket upon the propeller-shaft, a chain mounted upon the sprockets, and a grip to the strip.

2. The combination with a boat; of a frame hinged thereto, a propeller within said frame, means for imparting motion thereto, a shaft journaled below the frame, plates extending therefrom and adapted to contact with the frame, and means for revolving the shaft and raising the frame.

3. The combination with a boat; of frames hinged to the stern thereof, a shaft journaled within each frame, a propeller to each shaft, means for imparting motion to the shafts independently of each other, a shaft journaled below the frames, plates extending therefrom, and means for revolving said shafts and swinging the frames upward upon their hinges.

4. The combination with a boat; of frames hinged to the stern thereof, a shaft journaled within each frame, a propeller to each shaft, means for locking the frames together, means for imparting motion to the shafts and their propellers, brackets below the frames, a shaft journaled therein, plates extending from the shaft and contacting with the frames, and means for revolving the shaft and thereby raising the frames and their propellers.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE F. BRYAN.

Witnesses:

M. W. SIMMONS,  
G. E. LEGARE.

No. 691,805.

Patented Jan. 28, 1902.

S. R. PERRY.  
WATER CYCLE.

(Application filed Feb. 18, 1901.)

(No Model.)

Fig. 1.

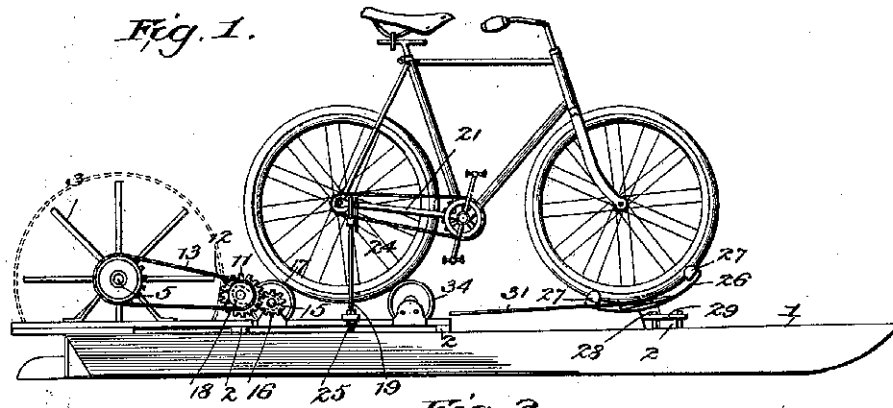


Fig. 2.

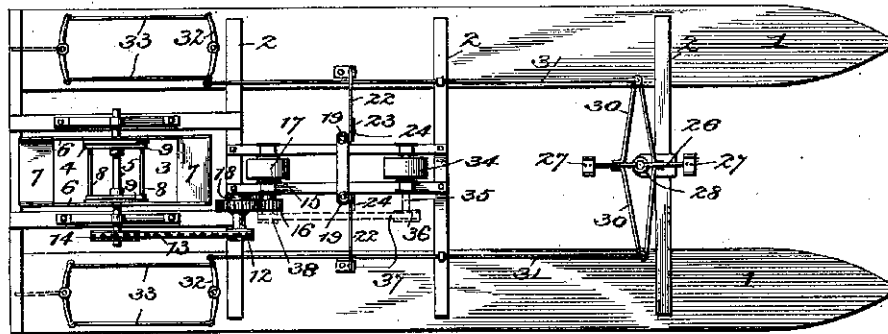


Fig. 3.

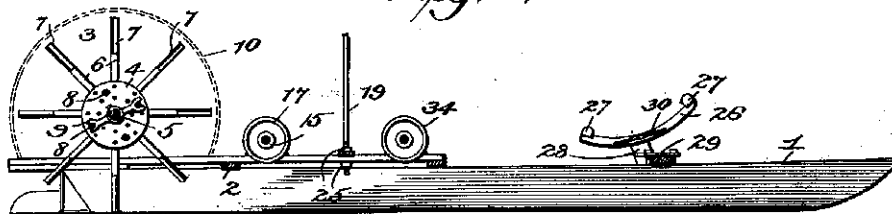
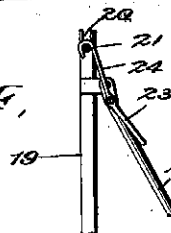


Fig. 4.



Witnesses  
H. H. Shaw  
Charles Shaw.

Inventor,  
Sylvester R. Perry,  
Attorneys

# UNITED STATES PATENT OFFICE.

SYLVESTER R. PERRY, OF WORCESTER, MASSACHUSETTS.

## WATER-CYCLE.

SPECIFICATION forming part of Letters Patent No. 691,805, dated January 28, 1902.

Application filed February 16, 1901. Serial No. 47,653. (No model.)

*To all whom it may concern:*

Be it known that I, SYLVESTER R. PERRY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Water-Cycle, of which the following is a specification.

My invention relates to water-cycles, and has for its object to produce a cycle in which the motive power is supplied by an ordinary bicycle placed thereon and in which the bicycle is adjustably secured for varying the amount of pressure between the driving-wheel and the operating mechanism of the cycle and also in which the power may be increased by means of tandem gearing.

Another object is to so construct the steering mechanism that it can be readily adjusted for different makes of bicycles, will be simple and easy in its operation, and will possess sufficient strength with extreme lightness.

A further object is to so construct the paddle-wheel that it can be cheaply constructed and that it will engage with the water in such a manner as to give the greatest propulsive force with the least expenditure of power.

With these objects in view my invention consists in the improved construction and novel arrangement of parts of a water-cycle, as will be hereinafter more fully set forth.

In the accompanying drawings, in which the same reference-numerals indicate corresponding parts in each of the views in which they occur, Figure 1 is a side elevation of a water-cycle embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a longitudinal sectional view. Fig. 4 is a detail view.

In constructing my improved water-cycle I secure two parallel floats 1 1 at a suitable distance apart by means of cross-bars 2 2. Journaled in suitable bearings at the rear ends of the floats is a paddle-wheel 3, which is preferably formed from two flanges 4, loosely mounted upon a shaft 5. Secured to each flange are radially-arranged arms 6, to the outer ends of which are secured paddles 7. The flanges are secured at the proper distances apart by means of rods 8, and two dogs

or clamps 9 are rigidly secured to the shaft 5, with their free ends in engagement with one or more of the rods 8, so that when the shaft is revolved the dogs or clamps will cause the paddle-wheel to revolve with it. The paddles 7 are preferably secured to the rear edges of the arms 6, so that when the wheel is being revolved it will be impossible for the water to pass out laterally. A suitable covering 10, as shown in dotted lines, may be placed over the wheel to prevent its throwing water upon the rider.

Journaled transversely of the cycle at a suitable distance in front of the paddle-wheel is a gear-wheel 11, one end of the hub of which is preferably extended beyond its bearing and provided with a sprocket-wheel 12. A chain 13 runs from the wheel 12 to a sprocket-wheel 14 on the end of the shaft 5 for the purpose of rotating the wheel. Journaled directly in front of the gear-wheel 11 is a shaft 15, upon which are rigidly secured a gear-pinion 16 and a friction-pulley 17. The gear-wheel 11 meshes with the gear-pinion 16, and its bearings are so arranged in relation thereto that the wheel may be raised or lowered for the purpose of tightening the chain. One means for securing the wheel 11 in this manner is by means of the ordinary slotted brackets 18, within which the shaft of the gear-wheel is mounted and secured in the same manner as is done in the ordinary gear-cutting lathes.

Directly in front of the friction-pulley and gear-pinion are two standards 19, the tops of which are preferably slotted, as shown at 20, for the reception of the rear portion of the frame of a bicycle 21, which is secured thereon for the purpose of propelling the cycle. A brace-rod 22 extends from each one of the floats nearly to the top of its respective standard and is rigidly secured thereto for the purpose of giving sufficient rigidity to the standards.

Pivotally secured at the upper ends of the braces, preferably by means of eccentric-levers 23, are two hooked clamps 24, which are adapted to be passed over the side bars of the frame of the bicycle to firmly secure the machine in position. The lower ends of the standards are preferably screw-threaded and

provided with nuts 25, by means of which the standards may be adjusted vertically to secure the proper amount of tension or pressure between the driving-wheel of the bicycle and the friction-pulley of the water-cycle, the periphery of said pulley being preferably flat and provided with a covering of rubber or other suitable yielding material.

The front wheel of the bicycle is supported in a cradle 26, which is pivotally mounted upon one of the cross-bars of the water-cycle. The cradle is preferably curved, with each end provided with a shoe 27, the shoe being curved in cross-section to correspond with the curvature of the tire of the bicycle. The pivot 28 of the cradle is secured to the cross-bar by means of a clamp 29, and the cross-bar is adjustable axially to permit of the pivot of the cradle being placed in perfect alignment with the fork of the bicycle and laterally to permit of its being moved longitudinally of the floats to adjust the cradle for the reception of the front wheel of the different makes of bicycles.

Two side arms 30 are secured to the cradle and extend laterally to a point over each of the floats, where they are connected with rods 31, which extend rearwardly through suitable bearings and are connected to one of the cross bars or yokes 32 of the rudder, there being a rudder upon each float and each rudder being provided with two cross bars or yokes, the ends of which are connected by suitable tie-rods 33. The side arms are preferably made tapering toward each end and are arranged flatwise to secure the necessary strength with the least amount of material, the material being preferably cut away at the central or wider portion.

If it be desired to increase the power of the bicycle-wheel upon the paddle-wheel, I provide an additional friction-pulley 34, which is journaled at a suitable point in front of the pulley 17 to be brought into engagement with the tire of the bicycle at a point in front of the standards 19. The periphery of this wheel is preferably flat and provided with a yielding rim or tire in the same manner as the pulley 17 and is also made adjustable vertically in its bearings in any suitable manner, so that it can be brought into or removed from contact with the rim of the bicycle-wheel whenever desired. Its shaft is extended at one end, as shown at 35, and provided with a sprocket-wheel 36, (shown only in dotted lines,) from which a sprocket-chain 37 extends to a sprocket-wheel 38, secured to the gear-pinion 16, said chain and wheel being also shown only in dotted lines. By arranging the parts in this manner the driving-wheel of the bicycle will contact with both pulleys and the power transmitted thereto will be transmitted through the sprocket-chains to the paddle-wheel.

In using my improved water-cycle the bicycle is rigidly secured in position upon the standards and in the cradle and adjusted so

as to secure the required pressure between its driving-wheel and the friction pulley or pulleys of the water-cycle. The rider then takes the seat of the bicycle and propels it in the same manner as upon the land, which will cause the paddle-wheel to be revolved with sufficient force and power to drive the water-cycle forward. The course of the water-cycle can be governed by the handle-bars of the bicycle in the same manner as though the bicycle were being used upon the land.

By means of the extra friction-pulley, which may be thrown into or out of gear, as desired, the water-cycle may be propelled with great speed or under adverse circumstances by moving it upward into contact with the driving-wheel of the bicycle, or it may be lowered out of contact with the wheel when it is desired to only use the ordinary pressure and friction for propelling the water-cycle. After use the bicycle can be quickly released from the water-cycle by simply operating the eccentric-levers to release the hooked clamps, when the bicycle may be lifted from the tops of the standards and removed from the water-cycle and operated the same as it was before being used upon the water-cycle.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a water-cycle, the combination, with a float provided with a paddle-wheel, of a friction-pulley for operating the wheel, two standards adjacent to the pulley, the lower end of each of which is screw-threaded and provided with nuts and the upper end is slotted, a brace for each standard, the upper end of which is provided with a hooked clamp and an eccentric-lever for causing the clamp to engage with the frame of a bicycle, substantially as described.

2. In a water-cycle, the combination, with a float, of a shaft journaled at the rear end thereof, two disks upon the shaft, rods between said disks, arms on said disks, paddles secured to said arms, clamps rigidly secured to the shaft and engaging with said rods, a friction-pulley, operating mechanism between said pulley and said shaft, and means for securing a bicycle in engagement with said pulley, substantially as described.

3. In a water-cycle, the combination, with a float, of a shaft journaled at the rear end thereof, two disks mounted thereon at a distance from each other, radially arranged arms secured to the disks, paddles secured to the rear edges of said arms, a friction-pulley and intermediate gearing device for operating said shaft and paddles, and means adjustable independently of and over said pulley for securing a bicycle in engagement with said pulley, substantially as described.

4. In a water-cycle, the combination, with two floats, each of which is provided with a rudder and two connected yokes, of cross-

bars for holding said floats at a distance from each other, one of which is provided with a cradle, side arms extending from said cradle to a point over the floats, rods from each end  
5 of said arms to said yokes, a paddle-wheel at the rear of said floats provided with means for operating the same, and means for sup-

porting a bicycle in said cradle and in position to operate the paddle-wheel, substantially as described.

SYLVESTER R. PERRY.

Witnesses:

HARRY A. WHITNEY,

FRANK S. BARTHOLOMEW.

No. 764,086.

PATENTED JULY 5, 1904.

C. WASEK.  
WATER BICYCLE BOAT.  
APPLICATION FILED OCT. 5, 1903.

NO MODEL.

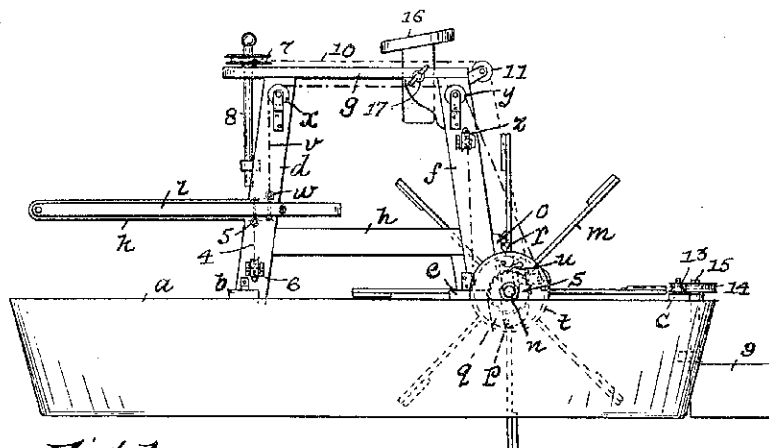


Fig. 1.

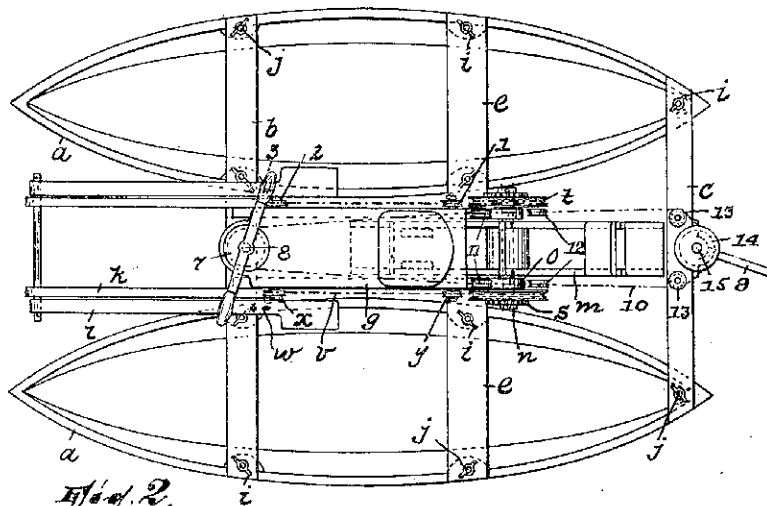


Fig. 2.

WITNESSES:

*Wm. D. Bell.*  
*Robert J. Pollitt.*

INVENTOR,

*Carl Wasek.*

BY

*Arthur L. Howard,*  
ATTORNEYS.

## UNITED STATES PATENT OFFICE.

CARL WASEK, OF PATERSON, NEW JERSEY.

## WATER-BICYCLE BOAT.

SPECIFICATION forming part of Letters Patent No. 764,086, dated July 5, 1904.

Application filed October 5, 1903. Serial No. 175,801. (No model.)

*To all whom it may concern:*

Be it known that I, CARL WASEK, a citizen of the United States, residing in Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Water-Bicycle Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The present invention has for its object to provide an improvement in water-vehicles propelled by man-power.

The invention will be found fully illustrated in the accompanying drawings, wherein—

Figure 1 is a view in side elevation thereof, and Fig. 2 is a top plan view.

*a a* designates two boats or canoes. These boats are secured together in spaced relation by means principally of cross-ties *b* and *c*. Certain framing now to be described and serving as a mount for the operator and to carry certain portions of the propelling mechanism coacts with these cross-ties to secure the boats together. On the cross-tie *b* are fixed two up-rights *d*, and on the adjacent ends of cross-pieces *e*, each of which spans only one boat, are fixed other up-rights *f*. Uprights *d* and *f* are surmounted by a horizontal plate *g*. Said cross-pieces are furthermore joined by a brace *h*. The frame, comprising cross-tie *b*, cross-pieces *e*, up-rights *d* and *f*, plate *g*, and braces *h*, is removably secured to the boats by wing-nuts *i*, carried on studs *j*, projecting upwardly from the boats and penetrating the cross-tie and cross-pieces. Corresponding studs and wing-nuts secure the cross-tie *c* to the boats.

*k* designates forwardly-projecting arms carried by the up-rights *d*. In the front ends of these arms are pivoted treadles *l*.

*m* designates the paddle-wheel. Its shaft *n* is journaled in blocks *o*, which are pivoted at *p* in extensions *q* of the lower ends of the up-rights *f*. These blocks are pivoted so that the wheel may be removed, and they are held in

position where they act as bearings for the shaft—that is to say, flat against up-rights *f*—by wing-nuts *r*. On the ends of the shaft are fixed ratchets *s*, and between these ratchets and the up-rights are loosely arranged on said shaft drums *t*. Said drums carry spring-actuated pawls *u*, engaging the ratchets.

*v* is a flexible connection secured at one end to an eyelet *w* on one of the treadles *l*, then passing up over a pulley *x* on the adjoining upright *d*, then extending back over a pulley *y* on the corresponding up-rights *f*, then down around the corresponding drum *t* several times, then up over a pulley *z* in said upright *f*, across to a corresponding pulley (not shown) in the other upright, then down around the other drum *t* several times, up over a pulley 1, arranged in the other upright *f*, then forward over another pulley 2, journaled in the other upright *d*, and then down to an eye 3 in the other treadle *l*.

4 is a flexible connection secured at its ends to corresponding eyes 5 in the under sides of the treadles *l* and between said eyes, extending under pulleys 6 in the up-rights *d*.

The arrangement of the flexible connections provides for transmitting the power from the treadles *l* to the drums in such manner that said treadles act reversely to each other. The effect is that while one drum is caused to rotate in one direction the other will be working in the opposite direction—that is to say, while one is acting through its pawl to drive the ratchet, and hence the paddle-wheel, the other will be proceeding reversely to the point where its pawl will take a new grip on the corresponding ratchet-wheel.

7 is a steering-wheel carried on a shaft 8, journaled in the framing vertically, and 9 is the rudder, said steering-wheel and the rudder being geared together by an endless wire cable or chain 10, which is wound around the wheel, then extends back over pulleys 11, carried by the framing, then down under pulleys 12, and then back around pulleys 13 and the wheel 14, carried by the rudder-posts 15.

16 is the seat for the operator, the same being adjustably secured in the plate *g* by a thumb-screw 17.

Having thus fully described my invention, I

what I claim as new, and desire to secure by Letters Patent, is—

In a water-vehicle, the combination of two boats, framing carried by said boats and securing the same in spaced relation, treadles  
5 carried by the framing, a propeller, a shaft for the propeller journaled in the framing, ratchets fixed on said shaft, trums loosely  
10 arranged on said shaft, spring-actuated pawls carried by said drums and engaging the ratchets, pulleys journaled in the frame, and a flexible driving means connected at its ends to said  
treadles and being continuous from one end

to the other, said flexible means being between its ends, extended successively around 15 said drums, and, between the drums, over said pulleys and a steering means, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 28th day of 20 September, 1903.

CARL WASEK

Witnesses:

JOHN W. STEWARD,  
JAMES B. NEWTON.

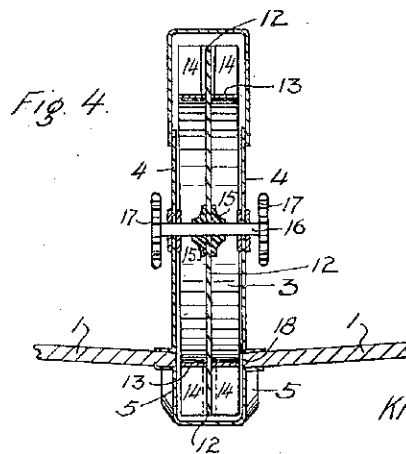
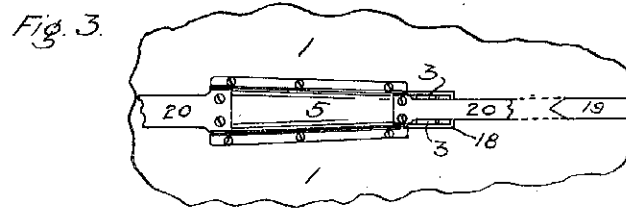
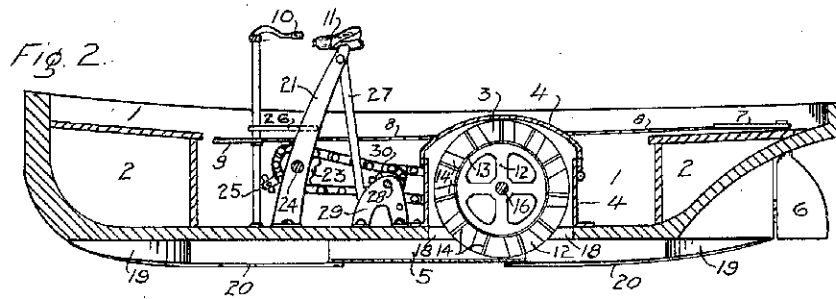
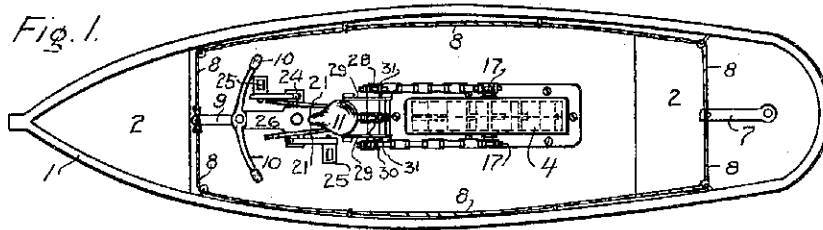




No. 792,687.

PATENTED JUNE 20, 1905.

K. O. WOLL.  
MARINE PROPULSION.  
APPLICATION FILED DEC. 23, 1904.



WITNESSES:

W. A. Voss House  
J. E. Voss

Krud O. Woll.  
INVENTOR.

BY P. J. Elliott  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

KNUD O. WOLL, OF NEAR TACOMA, WASHINGTON.

## MARINE PROPULSION.

SPECIFICATION forming part of Letters Patent No. 792,687, dated June 20, 1905.

Application filed December 23, 1904. Serial No. 233,078.

*To all whom it may concern:*

Be it known that I, KNUD O. WOLL, a citizen of the United States of America, residing near Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Marine Propulsion, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to devices for propelling vessels, and has for its objects to improve the construction of small paddle-wheels, to improve the watercourse, and to simplify the general construction of the driving mechanism. I attain these objects by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a boat equipped with my invention. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a plan of a part of the bottom of the boat, showing the watercourse-box; and Fig. 4 is a vertical cross-section through the propeller-box.

Similar numerals of reference refer to similar parts throughout the several views.

In the drawings I have shown a boat 1, provided with fore-and-aft air-compartments 2, which prevent it from sinking if swamped. My driving mechanism is constructed along the center line of the boat and consists of a propeller 3, journaled in the propeller-box 4 and projecting below the bottom of the boat 1 into the end of the watercourse-box 5, and pedal-operated sprocket-gearing adapted to drive said propeller. The boat 1 is steered by the rudder 6, having a tiller 7 above the aft air-compartment 2 and controlled by the ropes 8, which are secured to the tiller 7 and pass therefrom to each side of the boat and along the inside of the boat to the fore complementary tiller 9, journaled in the bottom of the boat and having handles 10 shaped similar to ordinary bicycle-handles and located conveniently in front of the seat 11 and above the pedals in such manner as to assist the bearing down of the foot on the pedals. The fore tiller 9 projects in front of its pivots, and consequently when the handles 10 are turned the rudder 6 turns to the same side as the fore tiller 9, and therefore the boat 1

swerves in the direction indicated by said tiller 9.

The propeller 3 is constructed of a plate 12, being cut out along radial lines to form spokes from the center and having the two circular bands 13 secured to each side at a distance equal to the height of the center of the propeller above the bottom of the boat, so that these bands 13 always practically close the hole in the bottom of the boat, as shown in Fig. 4. Outside of these bands I secure the blades 14, which may be most conveniently formed of angle-irons secured to the central web-plate 12. A reinforcing-hub 15 may be secured to each side of the center of the plate 12. The driving-shaft 16 passes through the hubs 15 and through the journals in the propeller-box 4 and is provided with sprocket-wheels 17 at each end. The box 4 fits closely around the propeller 3 and covers the hole 18 in the bottom of the boat 1. The upper portion of the box 4 is formed as a lid which is preferably hinged at the main portion.

Referring to Fig. 3, the watercourse-box 5 is set in the space formed by cutting away the deep keel 19 of the boat, leaving, however, an unoccupied space both before and behind the box 5, the keel 19 being sharpened at the points where it is cut away. The box 5 is considerably wider in front than at the rear and is set so that the propeller 3 is right in the rear thereof. The bars 20 extend from the box 5 to the parts of the keel 19.

I mount the seat and pedals in the following manner: At a suitable central point I secure the two bent frame-pieces 21 to the bottom. These pieces are spread wider at the bottom and come together at the top and are bent so that the bottom is farther forward than the top. A saddle 11 is suitably supported by the top of the frame 21. A sprocket-wheel 23 is mounted on a pedal-shaft 24 between the pieces 21. The pedals 25 are suitably mounted on cranks on the pedal-shaft 24. A brace 26 extends from the frame-pieces 21 to the steering-rod in front. A double rear brace 27 extends downward and rearward from under the saddle 11 to the bottom of the boat.

A counter-shaft 28 is mounted in bearings 100

on short frames 29, between the frames 21 and the box 4, and is provided with a central sprocket-wheel 30 and two end wheels 31, the central one being connected to the sprocket-wheel 23 and the end wheels 31 being similarly connected to the sprocket-wheels 17 on the propeller-shaft 16. The sizes of the sprocket-wheels 23, 30, 31, and 17 can be chosen to suit the requirements of the conditions under which the boat may be worked.

Having described my invention, what I claim is—

In a marine propeller, the combination with a vessel having a central hole in the bottom thereof, a propeller-box within said vessel and being open at the bottom and covering said

hole, a paddle-propeller journaled in said box and passing through said hole and below the vessel, a watercourse-box secured to the bottom of said vessel and open at its ends said watercourse-box extending forward of said hole in the vessel and being widest at its forward end, and a pedal-actuated set of sprocket-wheels and chains whereby said paddle-wheel may be rotated in said propeller-box.

In testimony whereof I affix my signature in presence of two witnesses.

KNUD O. WOLL.

Witnesses:

M. H. COREY,

M. A. VAN HOUSE.

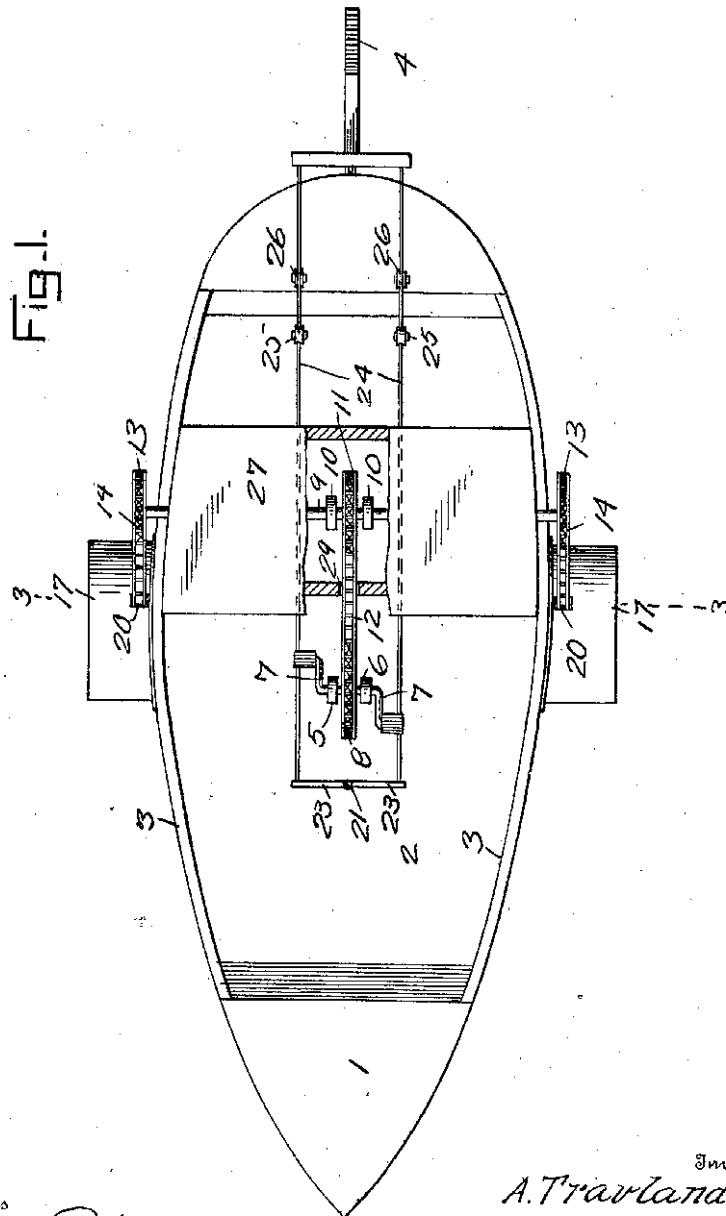


No. 869,277.

PATENTED OCT. 29, 1907.

A. TRAVLAND.  
BICYCLE BOAT.  
APPLICATION FILED APR. 11, 1907.

3 SHEETS—SHEET 1.



Witnesses

G. R. Thomas  
G. R. Thomas

334

Inventor  
A. Travland

Signature

Attorneys

No. 869,277.

PATENTED OCT. 29, 1907.

A. TRAVLAND.  
BICYCLE BOAT.  
APPLICATION FILED APR. 11, 1907.

3 SHEETS—SHEET 2.

FIG. 2.

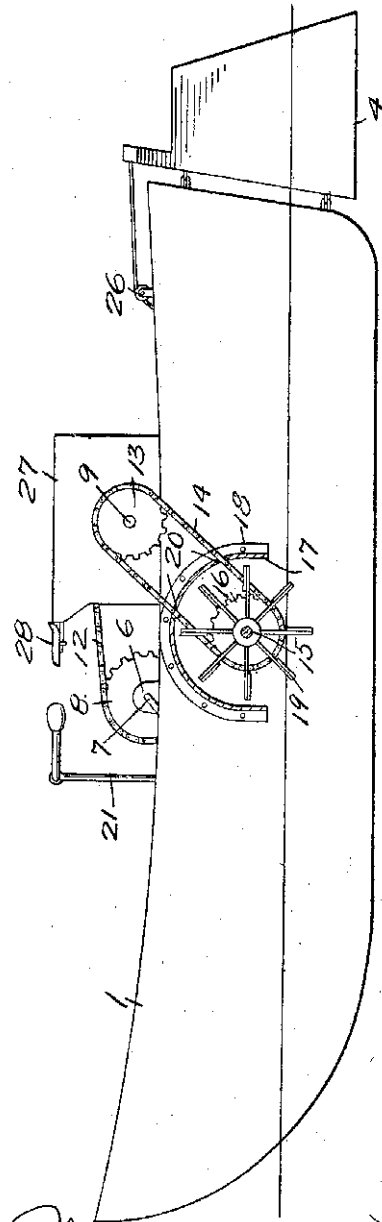
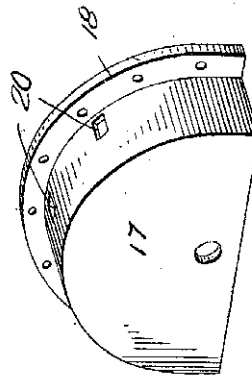


FIG. 5.



Witnesses

G. R. Thomas  
J. R. Thomas

By

A. Travland  
*(Signature)*

Inventor

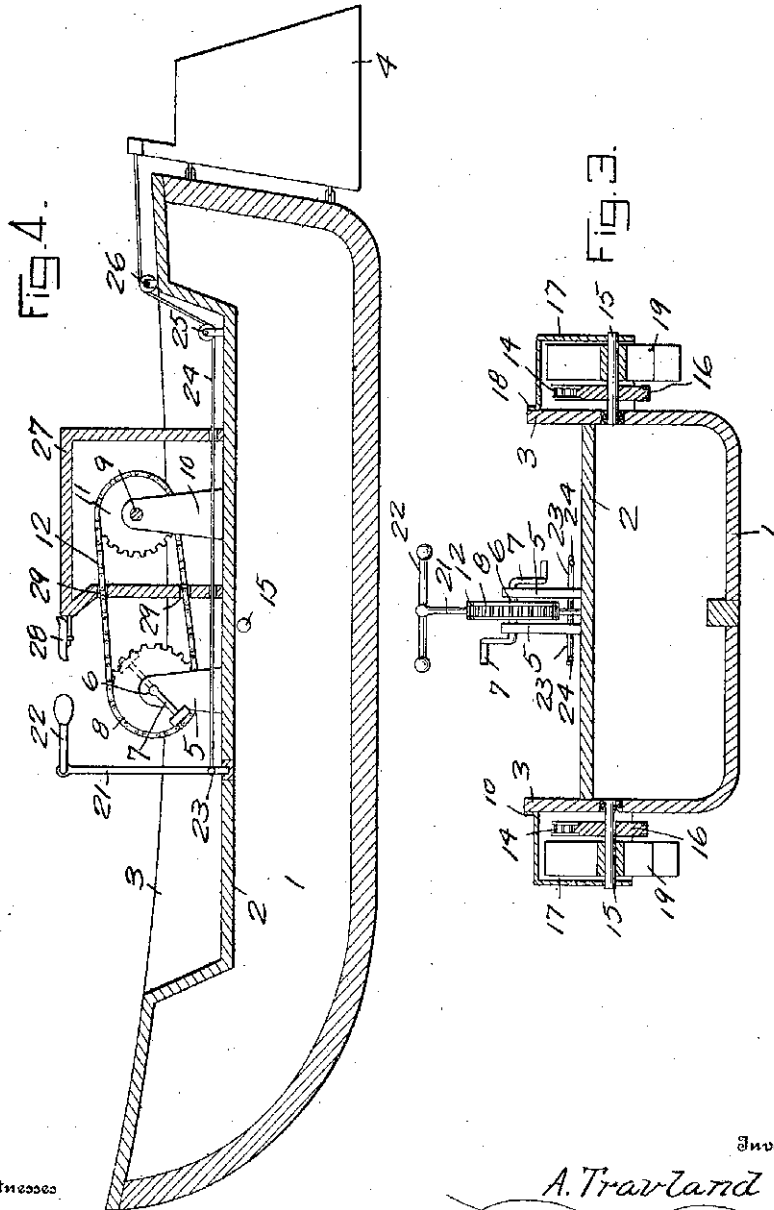
Attorneys

No. 869,277.

PATENTED OCT. 29, 1907.

A. TRAVLAND.  
BICYCLE BOAT.  
APPLICATION FILED APR. 11, 1907.

3 SHEETS—SHEET 3.



Witnesses

G. R. Phomes  
J. P. Mott

Inventor

A. Travland  
By *Charles Chandler*

Attorneys



# UNITED STATES PATENT OFFICE.

AANEN TRAVLAND, OF HOFFMAN, MINNESOTA.

## BICYCLE-BOAT.

No. 869,277.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed April 11, 1907. Serial No. 367,669.

*To all whom it may concern:*

Be it known that I, AANEN TRAVLAND, a citizen of the United States, residing at Hoffman, in the county of Grant, State of Minnesota, have invented certain  
5 new and useful Improvements in Bicycle-Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

*This invention relates to new and useful improve-*

close the paddle wheels 19 fast on the respective shafts and likewise the sprockets 16, said housings having openings 20 in their offset portions to allow of the movement of the chains 14 therethrough.

The steering mechanism includes a vertical rock 55 shaft 21 journaled in bearings in the deck 2, which at its upper end carries the handle bars 22 and at a point above the deck 2 carries the oppositely extending arms 23, the latter at their outer ends having connection with cables 24 which extend rearwardly the length of the 60

No. 876,385.

PATENTED JAN. 14, 1908.

J. A. McILWEE.

PROPELLING APPARATUS FOR BOATS.

APPLICATION FILED SEPT. 16, 1907.

2 SHEETS—SHEET 1.

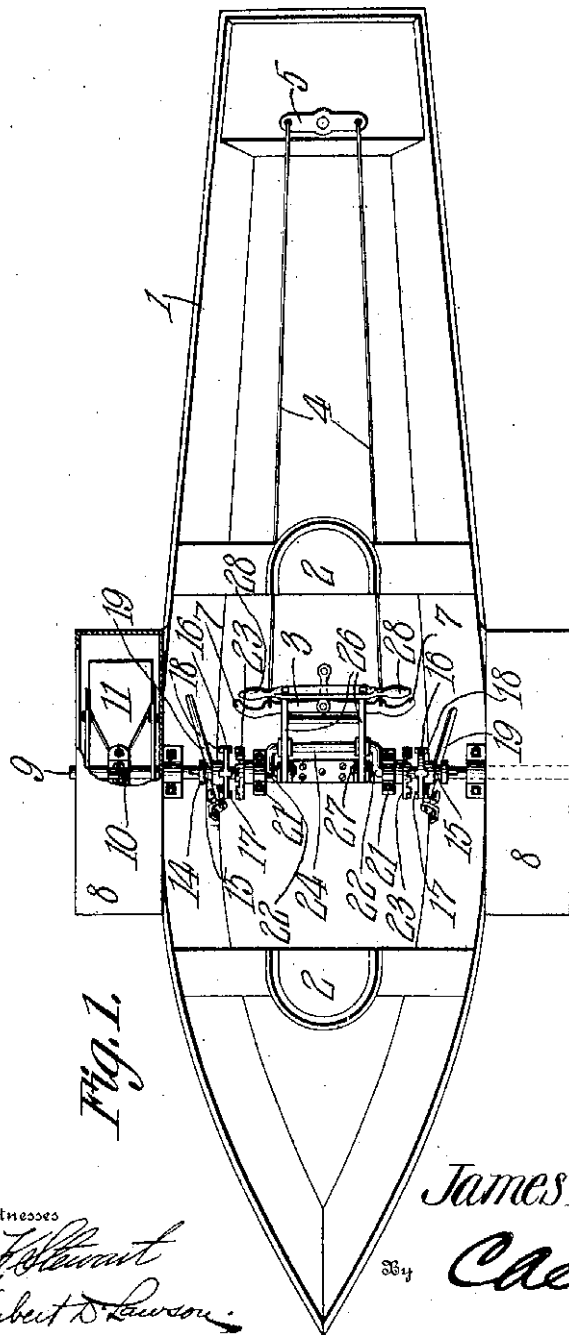


Fig. 1.

Witnesses  
*E. F. Stewart*  
*Hubert D. Lawson*

Inventor  
*James A. McIlwee*  
By *C. A. Snow & Co.*  
Attorneys

No. 876,385.

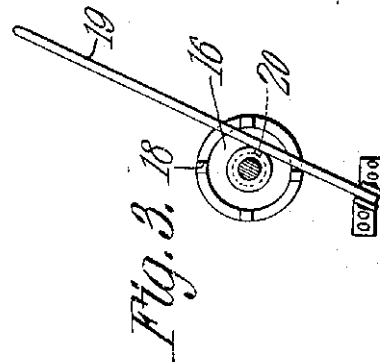
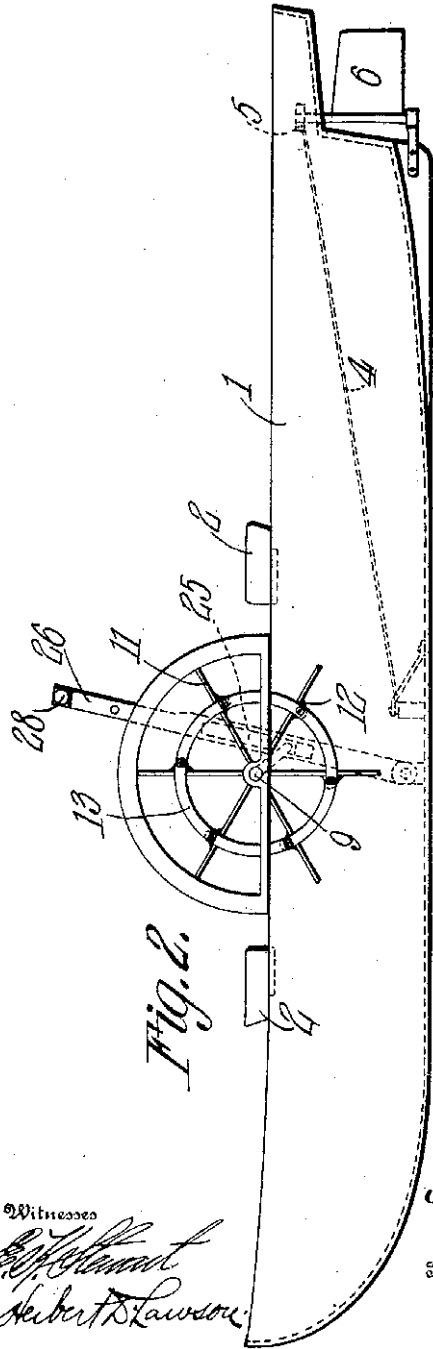
J. A. McILWEE.

PATENTED JAN. 14, 1908.

PROPELLING APPARATUS FOR BOATS.

APPLICATION FILED SEPT. 16, 1907.

2 SHEETS—SHEET 2.



Witnesses  
*Robert D. Lawson*

Inventor  
*James A. Mc Ilwee,*  
By *CA Snow & Co*  
Attorneys

# UNITED STATES PATENT OFFICE.

JAMES A. McILWEE, OF CRIPPLE CREEK, COLORADO.

## PROPELLING APPARATUS FOR BOATS.

No. 876,385.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed September 18, 1907. Serial No. 393,203.

*To all whom it may concern:*

Be it known that I, JAMES A. McILWEE, a citizen of the United States, residing at Cripple Creek, in the county of Teller and State of Colorado, have invented a new and useful Propelling Apparatus for Boats, of which the following is a specification.

This invention relates to propelling apparatus for boats and its object is to provide paddle wheels designed for use in connection with small boats and having mechanism whereby said wheels can be conveniently actuated by an occupant of the boat.

A still further object is to provide means whereby either or both paddle wheels used can be placed in or out of operative relation with the driving mechanism.

A still further object is to provide simple means whereby either or both of the paddle wheels can be locked against rotation.

Another object is to provide simple mechanism by means of which the person operating the boat can at the same time steer it.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a plan view of a boat embodying the present improvements, a portion of one of the paddle boxes and paddle wheels being broken away. Fig. 2 is a side elevation. Fig. 3 is an enlarged elevation of one of the clutch members and its actuating lever.

Referring to the figures by characters of reference, 1 designates a boat of any preferred construction having oppositely arranged seats 2 therein adjacent the center of the boat and located below and in front of the rear seat is a centrally fulcrumed steering lever 3 connected by means of cables 4 with oppositely extending arms 5 within the stern of the boat and secured to and movable with the rudder 6. The end portions of lever 3 constitute foot rests as indicated at 7 so that the person occupying the rear seat 2 can place his feet upon the rests 7 and readily steer the boat. Extending laterally from and secured to the gunwales of the boat are paddle boxes 8 preferably substantially semi-cylindrical in form and open at the bottom and within each paddle box is journaled

a shaft 9 having ears 10 radiating therefrom. To each ear is bolted or otherwise fastened a paddle 11 the inner end of which is of less width than the outer end thereof. Each paddle has ears 12 extending from one face thereof and bolted or otherwise fastened to reinforcing rings 13 which are arranged concentric with shaft 9.

Each shaft 9 extends a short distance into the boat and feathered upon the inner portion thereof is a sleeve 14 having an annular groove 15 and a disk-like head 16. Teeth 17 extend from the inner faces of the disks and projections 18 extend from the outer faces thereof. An inclined lever 19 is fulcrumed below each shaft 9 and has a projection 20 designed to project into groove 15.

Standards 21 are secured within the boat and journaled within them is a shaft 22 disposed in alinement with the shafts 9 and provided at each end with a toothed clutch member 23 which is fixedly secured to the shaft and designed to be engaged by the teeth 17 of the adjoining disk 16. A crank 24 is formed by that portion of the shaft 22 between the standards and extends through slots 25 formed in a lever 26 which is fulcrumed below the shaft as shown at 27. The upper portion of the lever has handles 28 whereby the same can be conveniently oscillated by a person or persons occupying the seats 2.

In using the mechanism herein described it is to be understood that the same may be actuated either by one or two persons occupying the seats 2. If one person alone is to operate the boat it will be necessary for him to assume the rear seat 2 so that by placing his feet upon the rests 7 it would be possible to steer the boat as well as to propel it. By pulling the levers 19 inwardly toward the center of the boat the disks 16 can be shifted so that their teeth 17 will engage the clutch members 23. By oscillating the handles 28 crank 24 will be rotated and cause a corresponding movement of the shafts and paddle wheels. As the levers 19 can be independently actuated it will be obvious that either or both of the paddle wheels can be placed in operative relation with the driving mechanism. Should it be desired to lock either or both of the wheels against movement, as when it is desired to quickly turn or stop the boat, the levers 19 are swung outwardly until one of the projections 18 on each disk 16

is caused to lap the adjoining lever whereupon said lever will act as a lock to prevent further rotation of the disk and paddles.

It will be seen that with this apparatus a considerable of speed rotation of the paddle wheels can be obtained and the boat can be readily propelled either backward or forward. Should the crank assume a position at a dead center it can be quickly moved by placing a foot upon the crank and pushing it downward.

What is claimed is:

1. The combination with a boat having oppositely disposed seats; of a drive shaft interposed between the seats and having a crank, oscillatory means interposed between the seats and engaging the crank for rotating the shafts, paddle wheels at the sides of the boat, a lever for placing either of said wheels in or out of operative relation with the drive shaft, and means disposed to be engaged by each lever to lock the wheels against movement.

2. The combination with a boat; of a drive shaft journaled therein, means for rotating the shaft, clutch members revoluble with the end portions of the shaft, shafts projecting beyond and alining with the first mentioned

shaft, paddles carried thereby, clutch members slidably engaging the projecting shafts, oscillatory means disposed when moved in one direction to shift the slidable clutch member into engagement with the adjoining clutch member of the drive shaft, and when shifted in the opposite direction to uncouple the clutch members and engage the slidable clutch member to lock it and its shaft against rotation.

3. The combination with a boat, paddle shafts journaled thereon, and a drive shaft; of a clutch member movably mounted upon each paddle shaft, and means disposed when moved in one direction to couple said member with the drive shaft, and when moved in the opposite direction to uncouple said member from the drive shaft and place it in engagement with said means to lock the paddle shaft against rotation.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES A. McILWEE.

Witnesses:

J. B. ROERIC,  
E. J. WHITE.

No. 879,389.

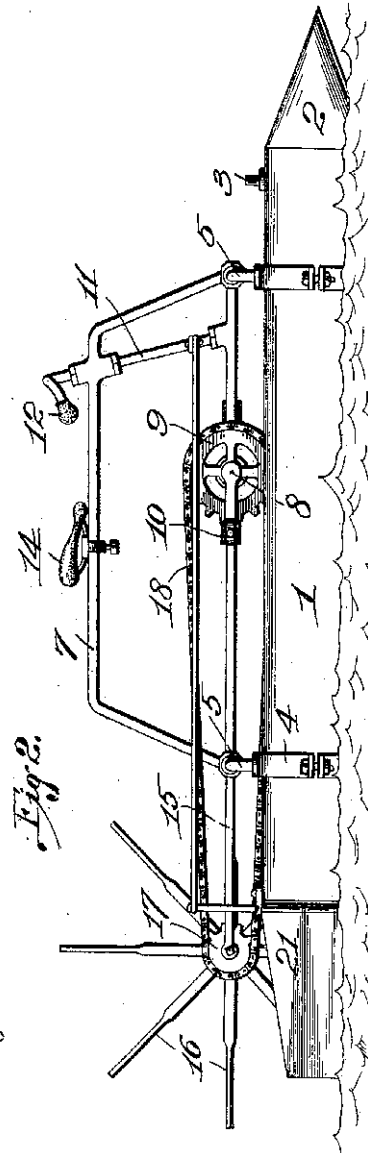
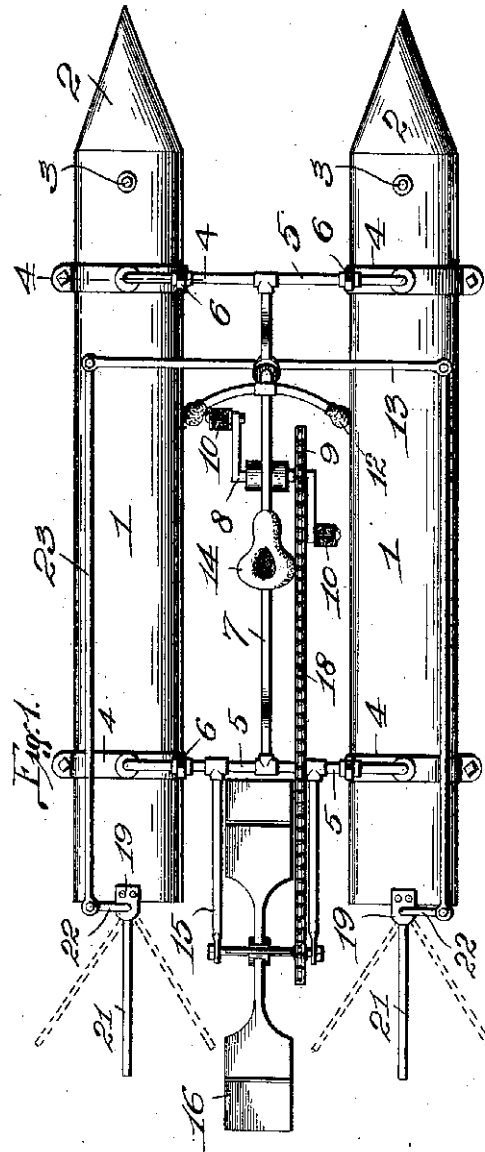
R. W. KREIS.

PATENTED FEB. 18, 1908.

WATER VELOCIPED.

APPLICATION FILED MAY 14, 1907.

2 SHEETS—SHEET 1.



Attest  
E. M. Harrington  
M. J. Smith

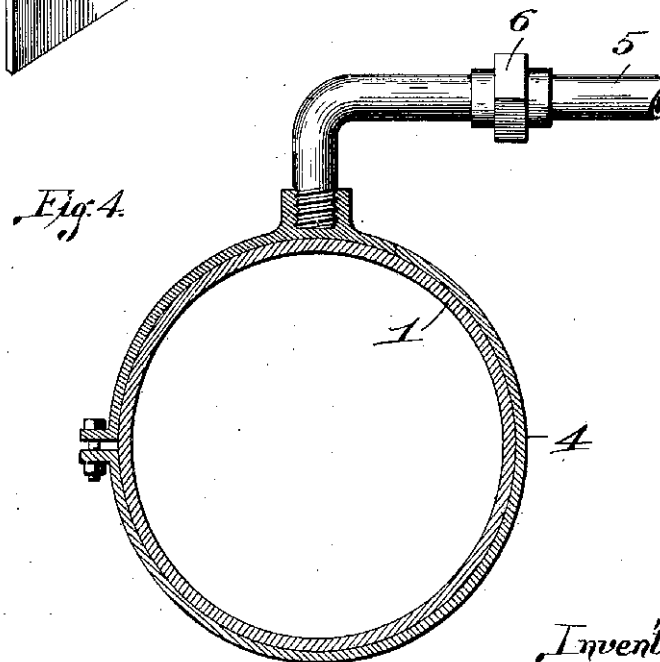
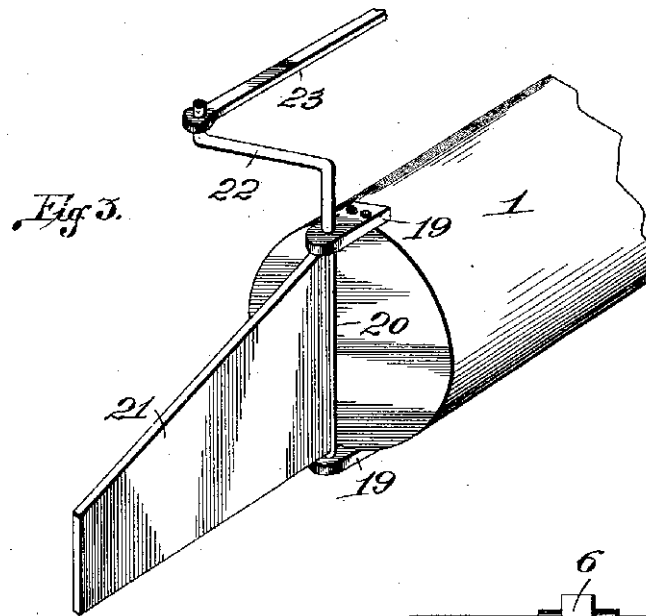
Inventor  
Robert W. Kreis.  
by Higdon Tongan ATTYS.

No. 879,389.

R. W. KREIS.  
WATER VELOCIPED.  
APPLICATION FILED MAY 14, 1907.

PATENTED FEB. 18, 1908.

2 SHEETS—SHEET 2.



*Attest.*  
*E. M. Harrington.*  
*W. O. Smith*

*Inventor.*  
*Robert W. Kreis.*  
*by Higdon Lougan ATTYS.*

# UNITED STATES PATENT OFFICE.

ROBERT W. KREIS, OF JENNINGS, MISSOURI.

## WATER-VELOCIPED.

No. 879,389.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed May 14, 1907. Serial No. 373,686.

*To all whom it may concern:*

Be it known that I, ROBERT W. KREIS, a citizen of the United States, and resident of Jennings, St. Louis county, Missouri, have invented certain new and useful Improvements in Water-Velocipedes, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a water velocipede, and my object being to construct a simple, inexpensive pleasure device to be pedally operated and driven on the water.

A further object of my invention is to construct a water velocipede which is especially buoyant, capable of being steered in any direction, and which will rest in a comparatively steady position on the surface of the water.

To the above purposes, my invention consists in certain novel features of construction and arrangement of parts, which will be hereinafter more fully set forth, pointed out in the claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of water velocipede of my improved construction; Fig. 2 is a side elevation of the velocipede; Fig. 3 is a perspective view of the rear end of one of the buoyant cylinders I make use of in carrying out my invention, and showing one of the rudders in position thereon; Fig. 4 is an enlarged transverse section taken approximately on the line 4—4 of Fig. 1.

In the construction of my improved velocipede, I make use of a pair of elongated hollow cylinders 1, constructed preferably of sheet metal, and the forward ends thereof being of conical form, as designated by 2, in order that said cylinders will travel forward with little resistance when driven by the propelling mechanism. These cylinders are provided with suitable inlet valves 3, by means of which air under pressure is pumped into the cylinders to increase their rigidity.

Passing around the cylinders 1, adjacent their ends, are sheet metal bands 4, and rigidly fixed to the tops thereof are the downwardly bent ends of a pair of transverse tubes 5, which unite said cylinders and hold the same parallel. Each of these tubes 5 is provided with a pair of unions 6, thus providing means for the insertion of long or short sections of tubing to vary the distance or space between the cylinders 1.

Rigidly fixed to the centers of the transversely arranged tubes 5 is a vertically disposed tubular frame 7, in the lower portion of which is arranged for rotation a crank shaft 8, on which is fixed a sprocket wheel 9, and said crank shaft being provided with a pair of pedals 10.

Arranged for operation in the forward portion of the frame 7 is a steering post 11, provided with a pair of handles 12 on its upper end, and fixed to the lower portion of said steering post is a pair of outwardly projecting arms 13.

Adjustably arranged on the upper portion of the frame 7, to the rear of the steering post 11, and above the crank shaft 8, is a seat 14.

Fixed to the rear one of the transverse tubes 5, and projecting rearwardly therefrom is a pair of arms 15, between the rear ends of which is arranged for rotation the shaft or hub of a paddle wheel 16. Fixed on the shaft or hub of this paddle wheel is a sprocket wheel 17, and passing around the same and the sprocket wheel 9 is a sprocket chain 18.

Fixed on the rear ends of the cylinders 1 are the vertically aligned bearings 19, in each of which is arranged for rotation a vertically disposed shaft 20, and fixed thereon and projecting rearwardly from the rear portions of the cylinders 1 are vertically disposed rudders 21.

The upper end of each of the shafts 20 is bent outwardly, as designated by 22, and pivotally connected to the outer ends of these outwardly bent portions are the rear ends of rods 23, the forward ends of which are pivotally connected to the outer ends of the arms 13.

When my improved water velocipede is in use, the operator positioned on the seat 14 pedally operates the crank shaft 8, and the rotary motion thereof is imparted to the paddle wheel 16 by means of the sprocket chain 18, and the blades of said paddle wheel dipping into the water in succession drive the velocipede forward.

To steer the velocipede to one side or the other, the operator partially rotates the steering post 11 by means of the handle 12; and in so doing, shifts the positions of the arms 13; and, by means of the connecting rods 23, correspondingly shifts the positions of the rudders 21, and thus the velocipede is guided as desired.

Water velocipedes of my improved con-



struction are primarily intended for amusement purposes in small lakes and lagoons in parks, and the like, although they may be constructed on a large scale and advantageously used on rivers and large bodies of water.

The hollow cylinders 1 are perfectly air and water tight, thus providing the proper buoyancy for the velocipede, and giving the same the proper strength with minimum weight.

I claim:—

A water velocipede, comprising a pair of hollow cylinders, of the same diameter throughout their length and provided with pointed forward ends, a pair of bands encircling each cylinder adjacent its ends, a tubu-

lar frame having its lower ends detachably seated in the bands at the tops of the cylinders, the transverse members of which frame are separable to permit the insertion of extra frame members, a paddle wheel arranged for rotation between the rear ends of the cylinders, pedally operated means for driving said wheel, a rudder arranged at the rear of each cylinder, and means whereby the rudders are simultaneously shifted.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

ROBERT W. KREIS.

Witnesses:

M. P. SMITH,  
E. L. WALLACE.

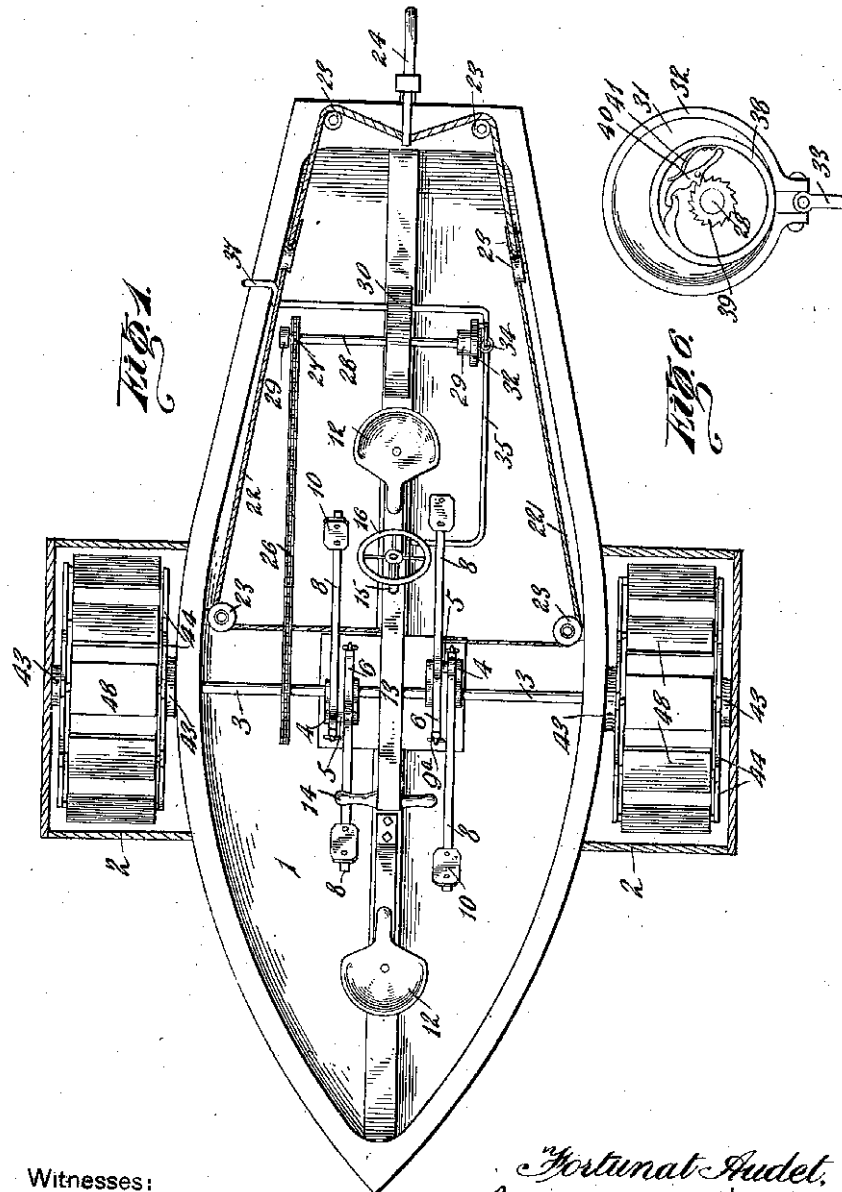
No. 881,650.

F. AUDET.  
BOAT.

PATENTED MAR. 10, 1908.

APPLICATION FILED MAY 10, 1906.

4 SHEETS—SHEET 1.



Witnesses:

*Eugene M. Slaney*  
*L. L. Cousins*

*Fortunat Audet*  
Inventor,  
By *Marion & Marion*  
Attorneys

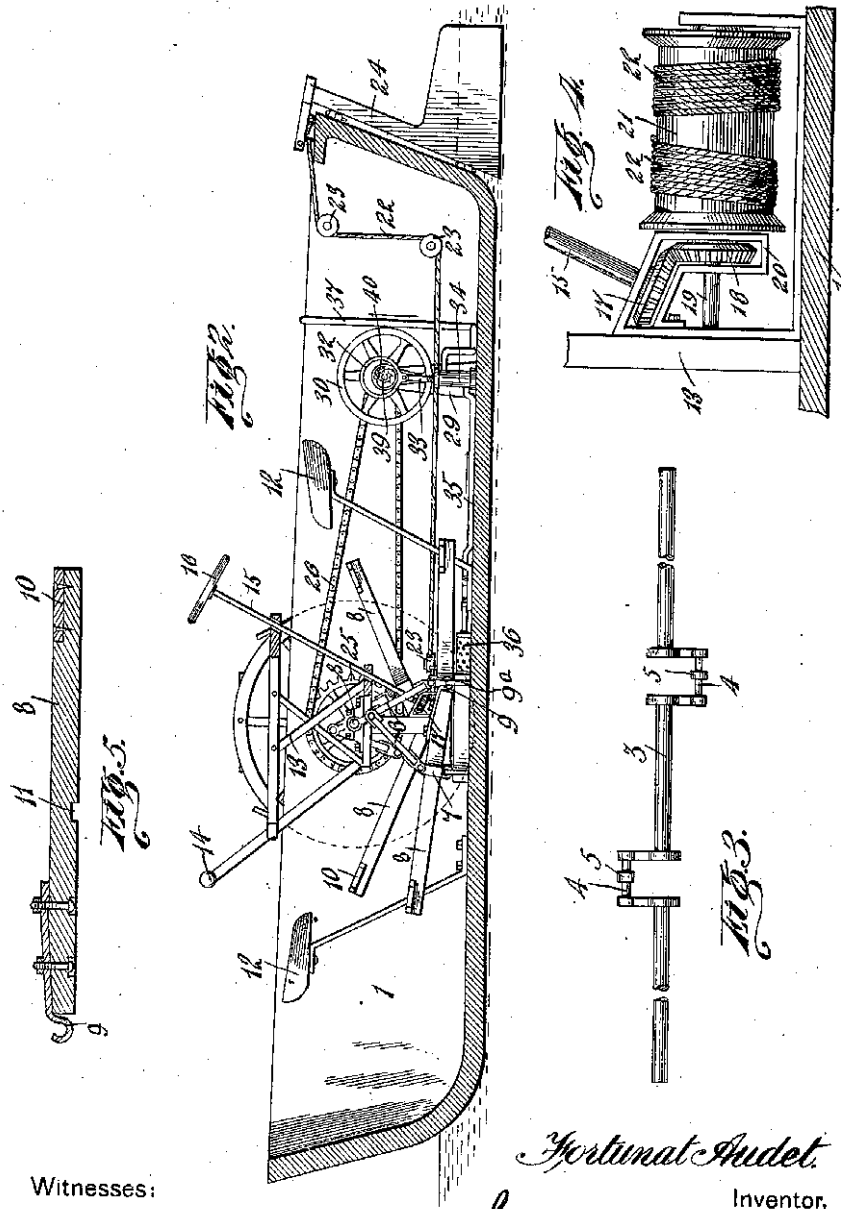
No. 881,650.

F. AUDET.  
BOAT.

PATENTED MAR. 10, 1908.

APPLICATION FILED MAY 10, 1906.

4 SHEETS—SHEET 2.



Witnesses:

*Eugene M. Hiney*  
*Claussins*

By

*Fortunat Audet*  
Inventor,  
*Harmon & Harmon*  
Attorneys

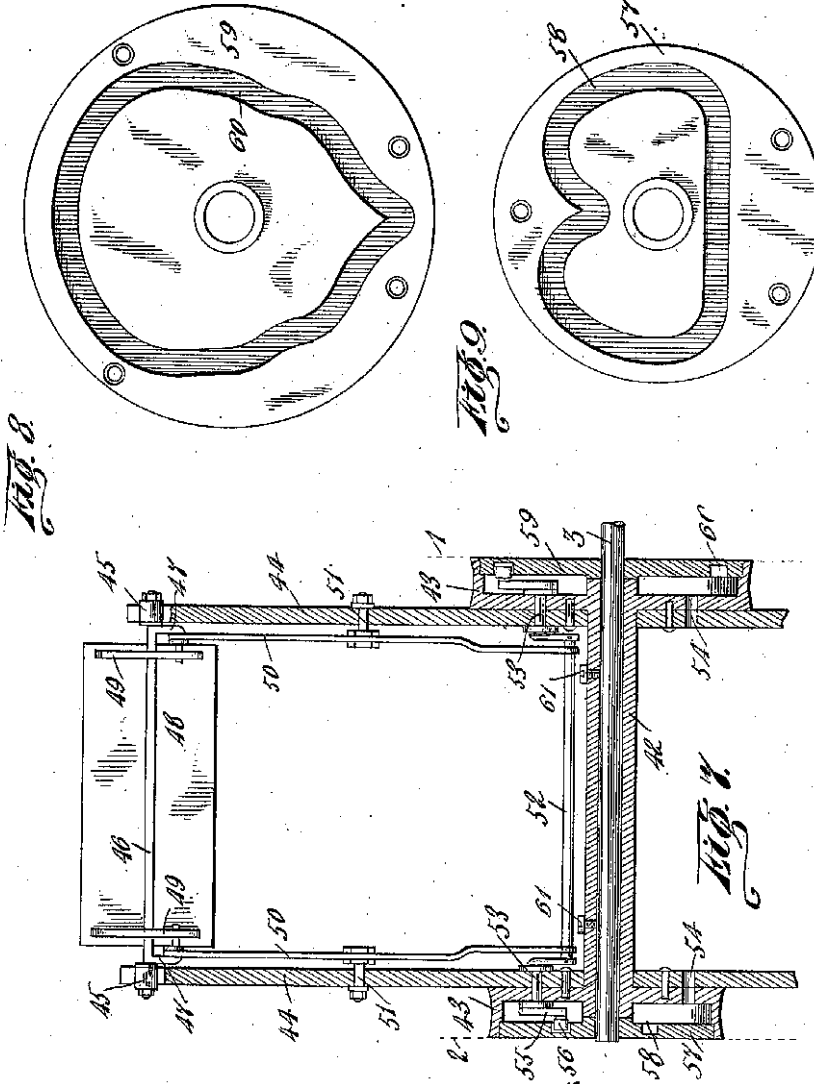
No. 881,650.

F. AUDET.  
BOAT.

PATENTED MAR. 10, 1908.

APPLICATION FILED MAY 10, 1906.

4 SHEETS—SHEET 3.



Witnesses:

*Eugene McIlroy*  
*W. J. Larsons*

By

*Marion Marion*  
Attorneys

*Fortunat Audet*

Inventor,

No. 881,650.

F. AUDET.  
BOAT.

PATENTED MAR. 10, 1908.

APPLICATION FILED MAY 10, 1906.

4 SHEETS—SHEET 4.

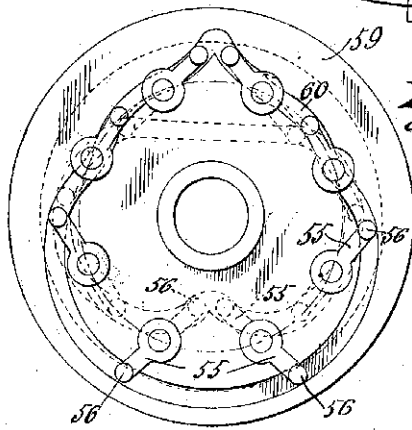
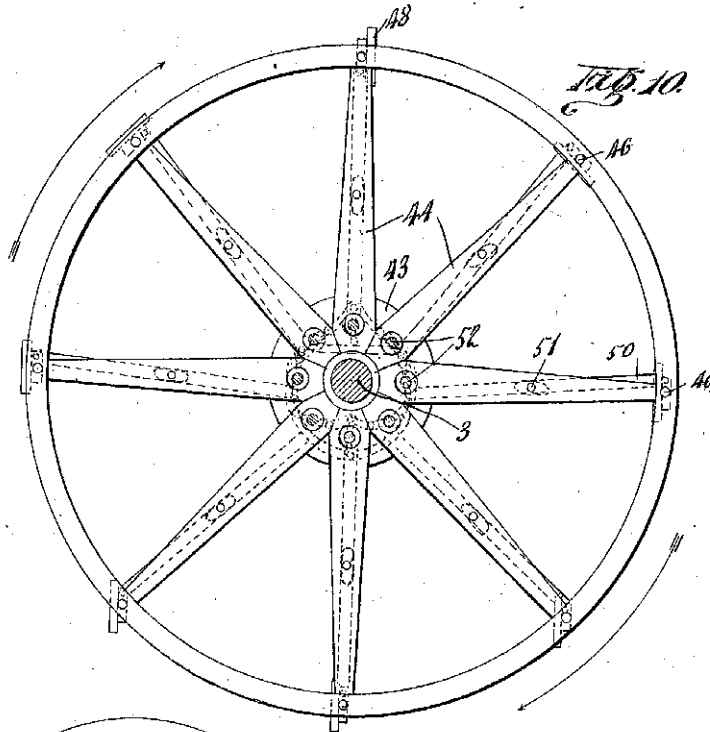


Fig. 11.

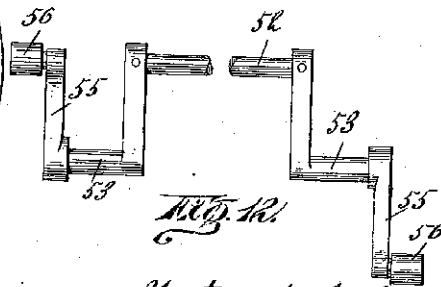


Fig. 12.

Witnesses:

Eugene McStiney  
C. Cousins

By

Fortunat Audet,  
Inventor,

Marion. Marion  
Attorneys

# UNITED STATES PATENT OFFICE.

FORTUNAT AUDET, OF ST. JEAN DES CHAILLONS, QUEBEC, CANADA.

## BOAT.

No. 881,650.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed May 10, 1906. Serial No. 316,063.

*To all whom it may concern:*

Be it known that I, FORTUNAT AUDET, a subject of the King of Great Britain, residing at St. Jean Des Chaillons, county of Lotbiniere, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Boats; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to boats; the object of my invention is to provide a paddle wheel with pivotally supported blades, and means for feathering the blades; a further object is to provide means for rotating the paddle wheels of a boat by foot power; a further object is to provide means for steering the boat; a further object is to provide means for pumping water out of the boat; and, my invention consists of the construction, combination and arrangement of parts, as herein illustrated, described and claimed.

In the accompanying drawings, forming part of this application, I have illustrated one form of embodiment of my invention, in which drawings similar reference characters designate corresponding parts, and in which:

Figure 1 is a plan view; Fig. 2 is a longitudinal vertical section taken centrally of the boat; Fig. 3 is a plan view of the paddle wheel shaft; Fig. 4 is a side elevation of the steering gear winding drum and its actuating means; Fig. 5 is a longitudinal section through one of the levers for actuating the paddle wheel shaft; Fig. 6 is an end elevation of the balance wheel shaft, showing the eccentric connection thereon for running a pump; Fig. 7 is a vertical transverse section through the upper half of a propeller wheel; Fig. 8 is an inside elevation of a channeled plate secured to the hub of the boat, and adapted to cause the blades of the paddle wheels to feather; and Fig. 9 is an inside elevation of a plate secured to one of the paddle boxes of the boat and adapted to cooperate with the plate shown in Fig. 8 to cause feathering of the blades of the paddle wheel. Fig. 10 is a diagrammatic view showing the position assumed by the rockable blades of the paddle wheel during the course of one rotation; Fig. 11 is a diagrammatic view showing in full lines the course of movement of the crank shafts adapted to feather the rockable blades on one side of the paddle wheel, and showing in dotted lines the position of the

crank shafts on the opposite side of the wheel; and, Fig. 12 is a plan view of the crank shaft and its rollers adapted to feather the blades of the paddle wheel.

Referring to the drawings, 1 designates a hull, to the opposite side walls of which are secured paddle boxes 2. Carried by the hull is a main shaft 3, having its ends projecting into the paddle boxes 2, and provided intermediate of its ends with crank portions 4. The crank portions 4 are divided by the collars 5, on each side of which collars are disposed the links 6 secured on the cranks 4, and adapted to rotate the shaft 3.

Carried by the links 6 are collars 7, through which are inserted the levers 8, having secured on their ends the hooked bearings 9 adapted to engage the staples 9<sup>a</sup>, secured on the hull 1. Secured on the free end of each lever 8, is a foot plate 10, and each lever is provided with a mortise 11 intermediate of its ends, adapted to receive the collars 7. The cranks 4, the links 6, and the levers 8 are so arranged that all dead centers are overcome, and reciprocation of the levers 8 will maintain the shaft 3 steadily rotating.

Carried by the hull on each side of the driving mechanism described, are seats 12, between which seats is a framework 13, on one side of which is a steadying handle 14, and on the opposite end of which framework is a steering rod 15, provided at its upper end with a hand-wheel 16, and provided with a beveled pinion 17 on its lower end. In mesh with the beveled pinion 17 is a beveled gear 18 carried on one end of a shaft 19, disposed in a framework 20. Carried on the shaft 19 is a winding drum 21, adapted to receive the steering ropes 22, which ropes pass over the guide pulleys 23 to the rudder 24.

Secured on the main shaft 3, is a sprocket wheel 25, over which is run a chain 26, connecting with a sprocket wheel 27, on a shaft 28. Said shaft is disposed in bearings 29, and has thereon centrally of the hull 1, a balance wheel 30, adapted to cause the shaft 3 to run steady and prevent the vibration which might be caused by the shaft being rotated by the foot power levers, as described.

Loosely disposed on one end of the shaft 28, is an eccentric, 31, over which is disposed an eccentric strap 32, connecting with a pump rod 33, adapted to run a pump 34. Leading from the pump is a pipe 35, having

a strainer 36 disposed adjacent the propelling mechanism of the boat, and leading from the pump is a discharge pipe 37, extending over the side of the hub.

5 Secured to the eccentric 31 is an annulus 38, and secured on the shaft 28 is a ratchet wheel 39, adapted to be engaged by a pawl 40 carried by the annulus and maintained in position normally by means of the spring 41, by means of which construction the eccentric 31 may be caused to rotate with the shaft 28, or the shaft 28 may rotate without rotating the eccentric.

15 Secured on each end of the shaft 3, outside of the hull 1, and adapted to rotate in the paddle boxes 2, is a hub 42. Each hub has at its opposite ends casings 43, and each hub carries the radiating spokes 44. Secured to the outer ends of the spokes are bearings 45, 20 in which are rockably disposed the shafts 46, which shafts have the extensions 47. Disposed between each pair of spokes is a paddle 48, having lugs 49, which lugs are engaged by the shaft 46 and the extension 47 thereon. Secured to the extensions 47, are 25 levers 50, which are pivoted centrally of their length, as at 51, and have their inner ends secured to auxiliary shafts 52. The auxiliary shafts 52 are provided with cranks 30 53, disposed in bearings 54 in the hub 42, and each crank 53 has thereon a crank 55 bearing on its end a roller 56.

Secured on the outer wall of the paddle boxes 2, are plates 57, provided with irregular channels 58, adapted to receive the 35 roller 56 on the end of the auxiliary shaft 52 next adjacent the paddle box. Secured to the hull 1, is a plate 59, provided with a channel 60, adapted to receive the roller 56 40 of the adjacent end of the auxiliary shaft 52.

The shaft 3 being rotated as described, the hub 42, which may be conveniently secured thereto by set-screws 61, will be caused to rotate carrying with it the paddles 48. The plates 57 and 59 being rigidly held 45 in position, the shafts 52 will be caused to rock, causing rocking of the levers 50, and the consequent rocking of the paddle wheels 48. The different positions assumed by the 50 paddle wheels are best shown in Fig. 10. As shown in that figure, the paddle wheels 48 always set in the water in a vertical position, so that any force exerted thereby will be in a straight line opposite to the direction 55 of the boat, so that the boat is propelled forward without any force being exerted in any direction except one which will force the boat forward.

Having thus described my invention, what 60 I claim as new and desire to secure by Letters Patent, is:—

1. In a boat, paddle wheels for propelling the same, a shaft for driving said paddle wheels, a plurality of rocking paddles at- 65 tached to said wheels and means for rocking

said paddles, said means comprising stationary plates with cam grooves therein, crank shafts journaled in the paddle wheels and having crank arms traveling in the aforesaid cam grooves whereby said shafts are 70 rocked by the rotation of the paddle wheels, and links connecting said shafts and the aforesaid blades.

2. In a boat, paddle wheels for propelling the same, a shaft for driving said paddle 75 wheels, a plurality of rocking paddles attached to said wheels and means for rocking said paddles said means comprising fixed plates having cam grooves therein, crank 80 shafts journaled in said paddle wheels and having cranks traversing said cam grooves whereby said shafts are rocked, and lever links connecting the paddles and said rock shafts said links being pivoted intermediate 85 their lengths whereby the rotary motion of the shafts is positively translated into reciprocating motion of the lever links.

3. In a boat, paddle wheels for propelling the same, a shaft for driving said paddle 90 wheels, a plurality of rocking paddles attached to said wheels and means for rocking said paddles, said means comprising fixed plates having cam grooves therein, crank 95 shafts journaled in the paddle wheels and having cranks traversing said cam grooves whereby said shafts are rocked, parallel links connecting said shafts and the opposite ends of the aforesaid paddles whereby said pad- 100 dles are rocked, and a loose sliding pivotal support for each of said links intermediate its ends.

4. In combination with the hull of a boat, a main shaft provided with crank portions, paddle wheels secured to the outer end of the 105 main shaft, links secured to the crank portions of the main shaft and provided with collars, levers disposed through the collars, hooked plates secured to one end of the levers, foot plates secured to the opposite ends of the lever, seats secured to the hull adja- 110 cent the ends of the levers, and a balance wheel disposed centrally of the hull and connected with the main crank shaft.

5. In combination with the hull of a boat, a main shaft, paddle wheels secured to the 115 ends of the shaft, means for driving the shaft, seats adjacent the driving means, a framework disposed centrally of the driving means and provided with a steadying handle adjacent one side, a steering rod carried by 120 the opposite side of the framework and provided with a hand-wheel, a beveled pinion on the end of the steering rod, a framework supported adjacent the lower end of the steering rod, a shaft carried by the frame- 125 work, a beveled gear in mesh with the beveled pinion on said shaft, a winding drum on the shaft, and a balance wheel connected with the main shaft and disposed centrally of the hull. 130

6. In combination with the hull of a boat,  
a main shaft, means for driving the main  
shaft, paddle wheels carried by the ends of  
the main shaft, a sprocket wheel on the main  
5 shaft, a chain disposed over the sprocket  
wheel, a second sprocket wheel adapted to  
receive the chain, a counter shaft adapted to  
support the second sprocket wheel, a balance  
wheel disposed on the counter shaft centrally  
10 of the hull, and pumping mechanism adapted  
to be actuated by the counter shaft.

7. In combination with the hull of a boat,  
a main shaft, means for driving the main  
shaft, paddle wheels carried by the ends of  
15 the main shaft, a sprocket wheel on the main  
shaft, a chain disposed over the sprocket  
wheel, a second sprocket wheel adapted to

receive the chain, a counter shaft adapted to  
support the second sprocket wheel, a balance  
wheel disposed on the counter shaft centrally 20  
of the hull, an eccentric on the counter shaft,  
a strap over the eccentric, a rod on the strap,  
a pump adapted to be actuated by the rod, a  
ratchet secured on the counter shaft, an an-  
nulus carried by the eccentric, and a spring- 25  
pressed pawl adapted to engage the ratchet  
and cause rotation of the eccentric.

In witness whereof I have hereunto set my  
hand in the presence of two witnesses.

FORTUNAT AUDET.

Witnesses:

T. MYNARD,

JOS. J. B. CHARBONNEAU.





F. X. RESCH.  
BOAT.  
APPLICATION FILED SEPT. 12, 1911.

1,024,419.

Patented Apr. 23, 1912.

Fig. 1.

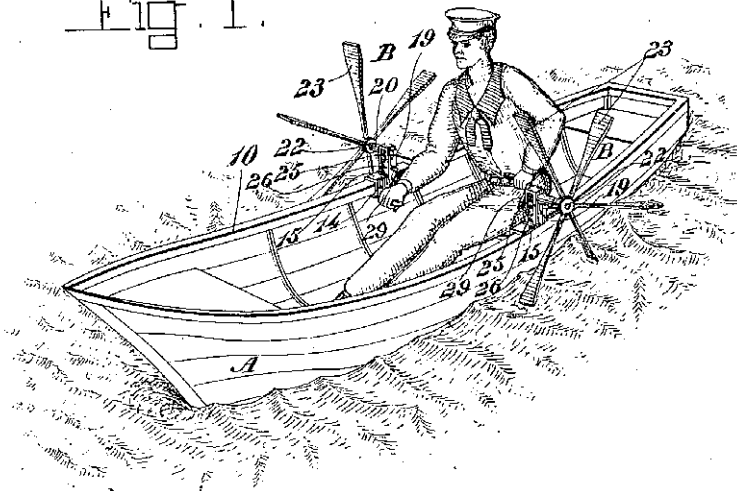


Fig. 4.

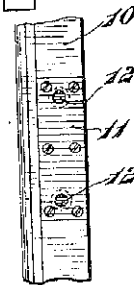


Fig. 2.

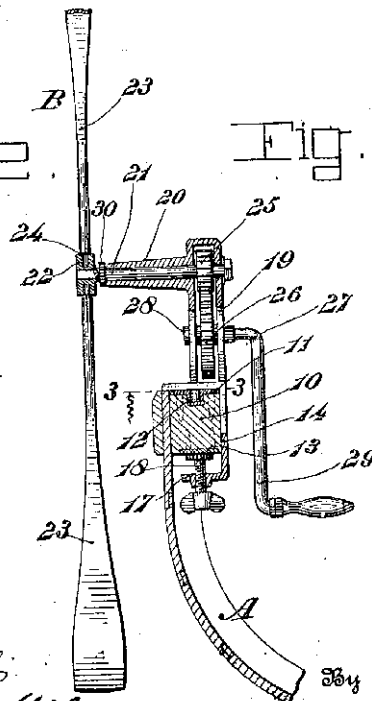
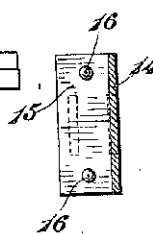


Fig. 3.



Inventor  
Francis X. Resch.

Witnesses  
Harry King  
Charles S. Wilson

By *Ym C. W. Sutter*

Attorney

# UNITED STATES PATENT OFFICE.

FRANCIS X. RESCH, OF WANETTE, OKLAHOMA.

BOAT.

1,024,419.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed September 12, 1911. Serial No. 648,944.

*To all whom it may concern:*

Be it known that I, FRANCIS X. RESCH, a citizen of the United States, residing at Wanette, in the county of Pottawatomie and State of Oklahoma, have invented certain new and useful Improvements in Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to boats and is designed particularly to construct a means whereby the boat may be propelled, by the elimination of oars, and that the operator may face the bow of the boat during the movement thereof.

With the above and other objects in view, this invention consists in the construction, combination and arrangement of parts, wherein—

Figure 1 is a perspective view of a boat supplied with the propelling mechanism forming the subject matter of the present invention. Fig. 2 is a transverse section of a gunwale, illustrating one of the propelling

the seat which the operator is adapted to occupy an elongated plate 11 is secured to the upper surface of the gunwale, on each side of the boat, each plate being provided with the depressions 12 formed from the body of the plate. A bearing plate 13 is secured to the underside of the gunwale directly under each plate 11 and provides a bearing from the clamping member, as will hereinafter be more fully described. A U-shaped gunwale engaging member 14 is adapted to span or embrace the gunwale 10 and is provided on the interior of the upper horizontal arms 15 with the inwardly projecting lugs 16, which are adapted to engage the depressions 12 of the plates 11. The lower horizontal arm 17, of the U-shaped member 14 is provided with an interior threaded opening, in which the clamping member 18 is adapted to operate, said clamping member bearing against the plate 13 when the device is in its operative position. A U-shaped vertical standard 19 is secured to the upper horizontal arm 15 of each gunwale engaging member 14 and is provided at its upper terminal with a tapered outwardly extending bearing 20, a

be broken the same may be removed and substitute blades secured to said hubs.

In order that the shafts may be firmly retained within the bearings 20 and be retained from reciprocation in said bearings a collar 30 is formed or otherwise secured to each shaft adjacent to the outer terminal of the cooperating bearing.

Having thus fully described my invention, what I claim as new and desire to secure as Letters Patent is:—

In a boat propelling mechanism, the combination with a gunwale, of plates secured to the upper and lower sides of the said gunwale, the plates secured to the upper side of said gunwales being provided with depressions, U-shaped gunwales engaging members adapted to span said gunwales, inwardly extending lugs carried by the upper horizontal arms of said U-shaped gunwale engaging members, adapted to engage the

depressions of the plates aforesaid, clamping means carried by the lower horizontal arms of said gunwale engaging members, U-shaped vertical standards carried by the upper horizontal arms of said gunwales engaging members, outwardly extending bearings carried at the upper terminals of said standard, shafts rotating in said bearings, hubs carried at the outer terminals of said shafts, paddle blades detachably secured to said hubs, a train of gears operating between the vertical arms of said standards, and adapted to operate said shaft, and means whereby said gears may be rotated.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS X. RESCH.

Witnesses:

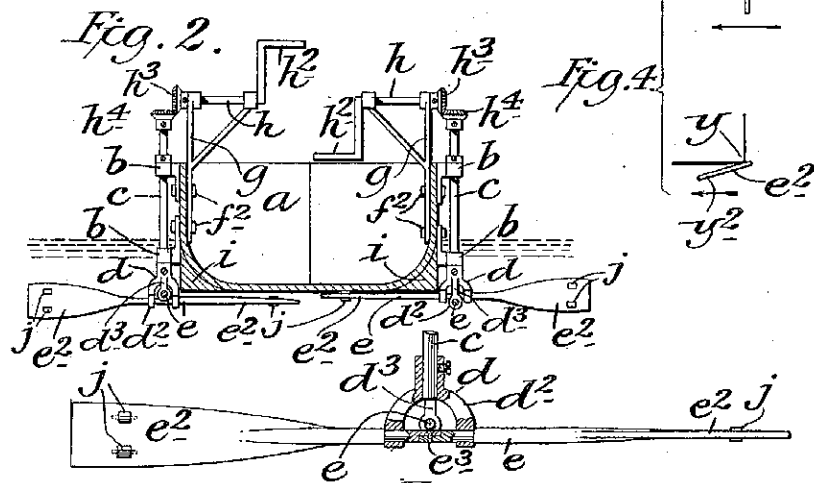
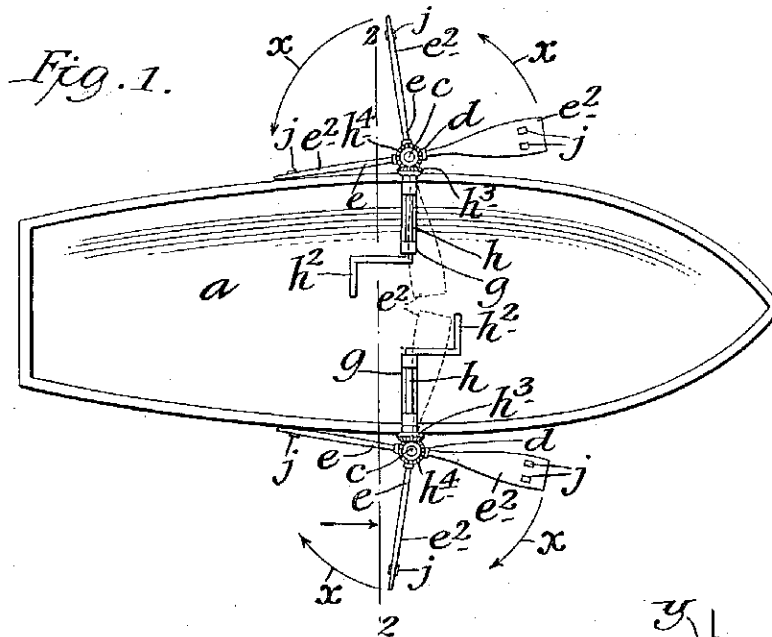
J. M. MUNDY,  
JOE REITER.



A. OPPENHEIMER.  
PROPELLER APPARATUS FOR BOATS.  
APPLICATION FILED OCT. 12, 1911.

1,028,265.

Patented June 4, 1912.



WITNESSES  
*A. R. Appleman*  
*Frank J. Atlee*

*Fig. 3.*  
INVENTOR  
*ALBERT OPPENHEIMER*  
BY  
*Edgar Tate & Co.*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

ALBERT OPPENHEIMER, OF NOTTING HILL, LONDON, ENGLAND.

## PROPELLER APPARATUS FOR BOATS.

1,028,265.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed October 12, 1911. Serial No. 654,213.

*To all whom it may concern:*

Be it known that I, ALBERT OPPENHEIMER, a subject of the King of Great Britain, and residing at Notting Hill, London, W., England, have invented certain new and useful Improvements in Propeller Apparatus for Boats, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to means for propelling boats, such as rowboats adapted to be propelled by oars, paddles or other hand-operated apparatus, and the object thereof is to provide a propelling apparatus of this class having great power and adapted to be easily operated and which may be applied to any boat of the class specified.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Figure 1 is a plan view of an ordinary rowboat provided with my improved propelling apparatus; Fig. 2 a transverse section on the line 2—2 of Fig. 1; Fig. 3 a sectional detail view of the bottom part of one side portion of the propelling apparatus, detached and on an enlarged scale, and; Fig. 4 a diagrammatic view indicating the operation of the apparatus.

In the drawing forming part of this specification, I have shown at *a* an ordinary rowboat which, in the construction shown, is provided with an approximately flat bottom, which may be of any desired shape in cross section.

In the practice of my invention and in the form of construction shown, I secure to the opposite sides of the hull of the boat vertically arranged brackets *b* in which are mounted vertical shafts *c* to the lower ends of which are secured double yoke-shaped hangers *d* one of which is shown in Fig. 3 partially in section, and both of which are clearly shown in Fig. 2. The double yoke-shaped hangers *d* are provided with two sets of arms *d*<sup>2</sup> and *d*<sup>3</sup> arranged at right angles to each other and the arms *d*<sup>2</sup> are slightly longer than the arms *d*<sup>3</sup> and mounted in each are blade rods or bars *e* having paddles *e*<sup>2</sup> at the opposite ends thereof, one of said paddles being in a plane at right angles to that of the other paddle. The

blade rods or bars *e* cross each other at right angles and are preferably composed of separate parts connected at *e*<sup>3</sup> in any desired manner, and said blade rods or bars are free to rotate independently in their support. The shafts *c* extend above the top brackets *b* which are secured to the outer side of the hull, and secured to the inner side of the hull, preferably by the same bolts or screws that secure the brackets *b* to the outer side of the hull as shown at *f*<sup>2</sup> are supports *g* which extend above the hull and in the top portions of which are mounted crank shafts *h* having handles *h*<sup>2</sup> and the outer ends of which are provided with beveled gears *h*<sup>3</sup> which mesh with corresponding beveled gears *h*<sup>4</sup> on the tops of the shafts *c*. With this construction and by turning the shafts *h*, the blade rods or bars *e* may be turned in a circle as indicated by the arrows *ø* in Fig. 1, and in practice, strike pieces *i* are secured to the bottom outer side portions of the hull and extended along the same in both directions a distance approximately equal to one-half the length of the blade rods or bars *e* and as the said blade rods or bars are rotated, the top edges of the blades at one end thereof are brought in contact with said strike pieces and said blades are turned into a horizontal position as they pass beneath the hull of the boat as clearly indicated in Fig. 2, while the blades at the outer or opposite ends of said rods or bars are turned into a vertical position as clearly indicated in Figs. 1 and 2. With this construction it will be seen that the said blades in moving through one-half of a circle, or that one-half of the circle through which they turn which is on the outer side of the hull of the boat, are in operative position, while the said blades moving through the other half of said circle or beneath the hull of the boat are in inoperative position and said blades are held in this position by the bottom of the hull of the boat as will be readily understood, and in order to reduce friction between the blades and the bottom of the hull of the boat, anti-friction rollers *j* are mounted in said blades.

The turning movement of the blades as hereinbefore described is indicated diagrammatically in Fig. 4, said blades at one end of the rods or bars *e* while in a vertical position striking the bottom edge portion of the hull or the strike pieces *i* as indicated at *y* and being thrown into the horizontal

position as indicated at  $y^2$ , which operation results in throwing the blades at the outer or opposite ends of said bars or rods into a vertical position. With this construction, as will be seen, great power can be developed and the crank shafts  $h$  may both be operated by one person or each may be separately operated, as desired.

My invention is not limited to the strike 10 pieces  $i$  and the bottom of the hull of the boat may serve to turn the blades, and other changes in and modifications of the construction herein described may be made, within the scope of the appended claim,

prising shafts, supported in a vertical position on the outer sides of the hull and provided at their lower ends with attachments in which are mounted blade rods or bars adapted to turn in a horizontal plane beneath the hull, and rotatable in said attachments and which are provided at their opposite ends with blades arranged in planes at right angles to each other, said rods or bars being rotated by the blades coming in 25 contact with the bottom of the hull. 30

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 31 day of October 1911





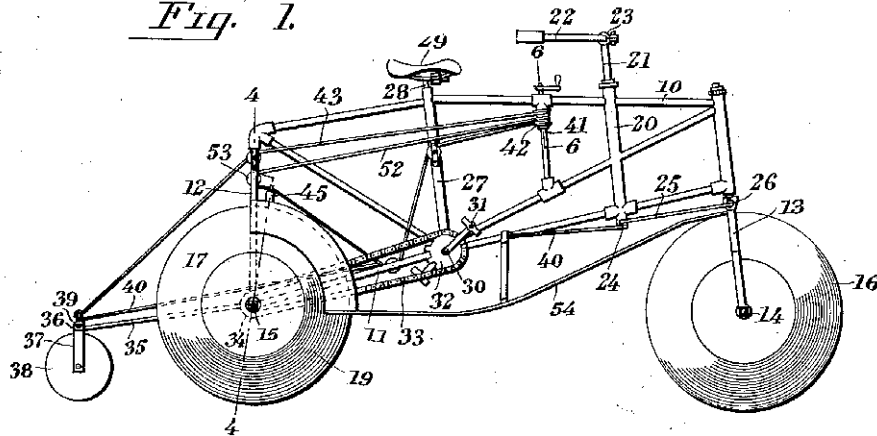
M. M. MALLORY.  
TRICYCLE.  
APPLICATION FILED NOV. 13, 1912.

1,083,115.

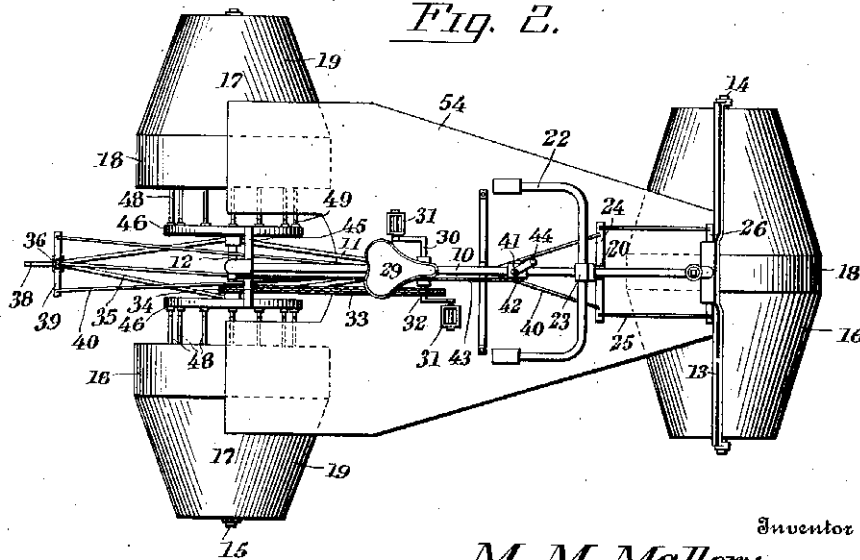
Patented Dec. 30, 1913.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 2.*



Inventor

*M. M. Mallory*

Witnesses

*M. F. Hammett*  
*F. O. Barber*

By *Victor J. Evans*

Attorney

M. M. MALLORY.

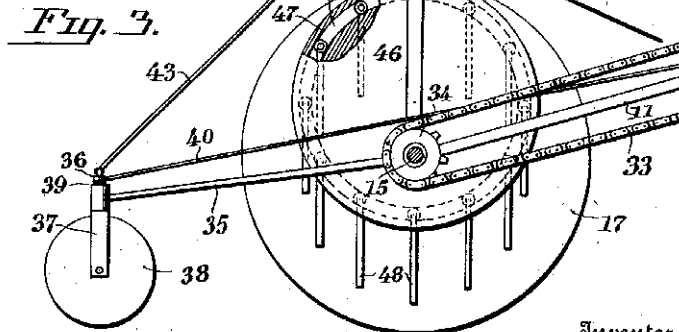
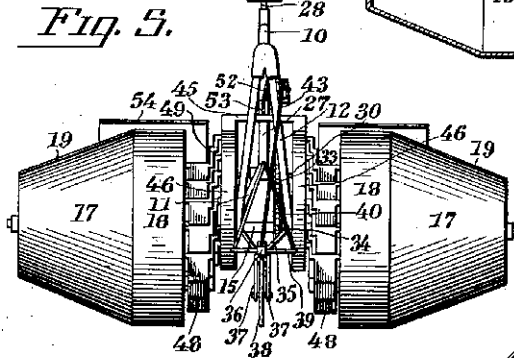
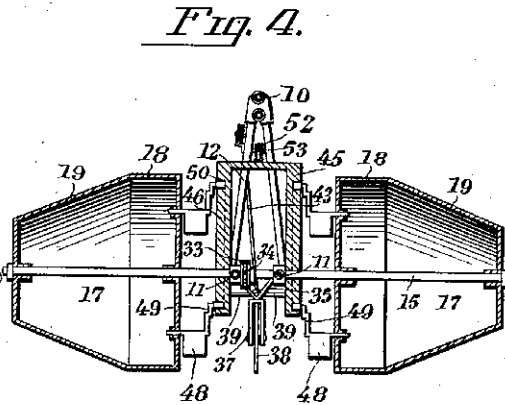
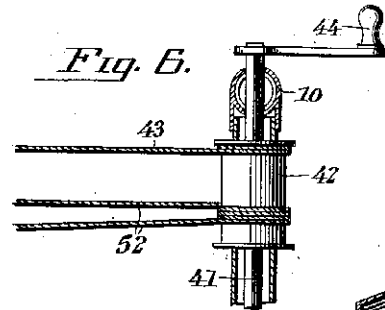
TRICYCLE.

APPLICATION FILED NOV. 13, 1912.

1,083,115.

Patented Dec. 30, 1913.

2 SHEETS-SHEET 2.



Inventor

M. M. Mallory

Witnesses

M. F. Lammitt  
J. O. Sanders

By Victor J. Evans  
Attorney

# UNITED STATES PATENT OFFICE.

MILTON M. MALLORY, OF SPRINGFIELD, OREGON.

TRICYCLE.

1,083,115.

Specification of Letters Patent.

Patented Dec. 30, 1913.

Application filed November 13, 1912. Serial No. 731,152.

*To all whom it may concern:*

Be it known that I, MILTON M. MALLORY, a citizen of the United States, residing at Springfield, in the county of Lane and State of Oregon, have invented new and useful Improvements in Tricycles, of which the following is a specification.

The invention relates to tricycles and more particularly to the class of combination tricycles.

The primary object of the invention is the provision of a tricycle of this character which may be used for traveling either upon land or water, and is capable of manual manipulation for the driving and guiding thereof in any preferred course.

Another object of the invention is the provision of a device of this character in which the water pedals are held in a novel manner so as to enter and leave the water when the device is traveling thereon and to effect maximum power for the driving of the said device.

A further object of the invention is the provision of a device of this character in which pedals may be raised and lowered so that the said device can travel in shallow or deep water and also may be driven upon the ground surface without liability of the pedals interfering with the travel thereof.

A still further object of the invention is the provision of a device of this character which is simple in construction, thoroughly reliable and efficient in its operation, strong, durable, and inexpensive in manufacture.

With these and other objects in view the invention consists in the construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings: Figure 1 is a side elevation of a tricycle constructed in accordance with the invention. Fig. 2 is a top plan view thereof. Fig. 3 is a fragmentary vertical longitudinal sectional view through the device. Fig. 4 is a sectional view on the line 4-4 of Fig. 1. Fig. 5 is a rear elevation. Fig. 6 is a sectional view on the line 6-6 of Fig. 1.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings by numerals, the machine or tricycle comprises a main frame 10 preferably formed from metal tub-

ing having a lower rear fork 11 an upper fork 12 and a front turning fork 13, the said forks being designed to support front and rear axles 14 and 15 which are journaled therein in any suitable manner, and upon the axle 14 is supported a front wheel 16, while supported upon the rear axle 15 is a pair of rear wheels 17, each of the latter being formed with a straight tread 18 and an outwardly tapered tread 19 respectively.

The front wheel has its straight tread 18 medially thereof, while the two rear wheels 17 have their straight tread at the inner ends thereof. Suitably mounted in the frame 10 rearwardly of the front turning fork is a steering shaft post 20 in which is mounted a steering rod 21 to the upper end of which is connected a handle bar 22 by means of a clamp 23 integrally formed with the shaft 21, while carried at the lower end of the latter is a cross piece 24 to which are pivotally connected forwardly extending steering rods 25, the same being also pivotally connected to the crown 26 of the front fork so that upon manipulation of the handle bar 22 the said fork can be turned for the guiding of the front wheel 16 as will be clearly apparent. Formed in the frame 10 rearwardly of the steering post 20 is a saddle post 27 in which is adjustably mounted a seat stem 28 carrying a saddle 29 of the ordinary well-known construction, which is to be occupied by the operator of the machine. Suitably journaled in the seat post 27 is a driving axle 30 the same being formed with crank pedals and on the shaft 30 is fixed a sprocket wheel 32 over which is trained a driving sprocket chain 33, the same being also trained over a sprocket gear 34 fixed to the rear axle 18 so that on pedaling by the rider the machine can be guided in the desired direction. Swingingly connected to the rear axle 18 and extending rearwardly therefrom is a rudder frame 35, in which is rotatably mounted the vertical stem 36 of a turning fork 37, which has journaled therein a rotatable rudder wheel 38, the stem 36 at its upper end being formed with oppositely extending arms 39 to which are connected steering cables 40, which are connected to the cross piece 24 of the steering shaft 21, the cables 40 being crossed so that on the turning of the shaft 21, the rudder wheel 38 will be shifted in a reverse direction to the shifted

position of the front wheel, thereby properly guiding the machine in its course.

Suitably journaled in the frame 10 between the steering shaft posts 20 and the seat post 27 is a turning shaft 41, the same carrying a winding and unwinding drum 42 to which is connected one end of a lift cable 43, the same being fixed to the rudder frame 35, so that on the winding of the cable 43 upon the drum 42 the said frame 35 can be raised and on reversely turning the shaft the latter may be lowered with respect to the ground. This shaft 41 is formed with a hand crank 44 which permits the convenient manipulation thereof for the raising and lowering of the rudder frame 35 as the occasion may require.

Swingly connected to the rear axle 15 is an inverted U-shaped frame 45 to which are fixed circular shaped guide members 46 which are eccentrically disposed with respect to the said rear axle 15 and each of which has formed thereon a circular guide groove or channel 47 near the outer periphery thereof, while pivoted eccentrically with respect to the axis of the rear wheel 17 at the inner ends thereof are paddle blades 48, the same being formed with guide arms 49 carrying friction rollers 50 at their free inner turned ends, the rollers being designed to engage and travel in the guide grooves or channels 47 in the member 46, so that upon the rotation of the rear wheels 17 the paddle blades 48 will be sustained in proper working relation with respect to a body of water, so that the said blades will freely enter and leave the water without impeding the forward travel of the machine. The arms 49 of the blades are loosely engaged in rings 51 which sustain the paddles in spaced relation to each other and at equal distance apart during the rotation of the rear wheel 17 when the machine is being operated. The tapered formation of the front and rear wheels 16 and 17 will prevent the toppling over of the machine when making a curve and said wheels are of hollow formation so as to give requisite buoyancy to the machine when afloat in a body of water.

The drum 42 fixed to the shaft 41 has connected thereto the ends of a raising and lowering cable 52 which ends are adapted to be reversely wound or wrapped with respect to each other upon the said drum, while connected at a point intermediate the ends of said cable 52 is the frame 45, the cable being trained over guide pulleys 53, two of which are fixed to the rear forks 11 and 12 respectively of the frame of the machine, while the other pulley is mounted upon the post 27, thus it being seen that on turning the shaft 41 one end of the cable will be unwound therefrom while the opposite end will be wound thereon, causing the swinging of the frame 45 for the raising

or lowering of the same, and in this manner the guide members 46 will be shifted for the raising or lowering of the paddles 48 to permit the machine to travel in shallow or deep water. It will be apparent that when the guide members 46 are turned slightly about the shaft 15 the paddles 48 will be altered or shifted by reason of their connection with the said guide members because the eccentric relation of the guide members will be changed with respect to the rear wheels or rollers 17 as the guide members can be thrown in their eccentric relation either forwardly or rearwardly with respect to the axle 15 carrying the rollers 17 thereby slanting the paddles 48 from perpendicular position as shown in Fig. 3 of the drawing.

Suitably secured to the frame 10 and extended throughout a greater portion of the length thereof and partially over the upper portions of the rear wheels 17 is a shield or mud and water guard 54, which prevents the splashing of water upon the rider of the machine as well as protecting the said rider from mud or dirt lifted by the wheels during the travel of the machine.

From the foregoing description taken in connection with the accompanying drawings, it is thought that the construction and operation of the invention will be clearly understood, and therefore, a more extended explanation has been omitted.

What is claimed is:

1. A device of the class described comprising a frame, front and rear wheels journaled in said frame, guide members mounted between the rear wheels and swingingly connected with their axis, the said guide members being eccentrically disposed with respect to the axis of the rear wheels and having circular guide grooves therein, a plurality of paddle blades pivotally mounted concentrically with respect to their axes and arms extending from the paddle blades and engageable in the grooves in the guide members whereby on the rotation of the rear wheels the said paddle blades will be actuated for the driving of the machine.

2. A device of the class described comprising a frame, front and rear wheels journaled in said frame, guide members mounted between the rear wheels and swingingly connected with their axis, the said guide members being eccentrically disposed with respect to the axis of the rear wheels and having circular guide grooves therein, a plurality of paddle blades pivotally mounted concentrically with respect to their axes, arms extending from the paddle blades and engageable in the grooves in the guide members whereby on the rotation of the rear wheels the said paddle blades will be actuated for the driving of the machine, and means for driving the rear wheels.

3. A device of the class described comprising a frame, front and rear wheels journaled in said frame, guide members mounted between the rear wheels and swing-  
 5 ingly connected with their axis, the said guide members being eccentrically disposed with respect to the axis of the rear wheels and having circular guide grooves therein, a plurality of paddle blades pivotally  
 10 mounted concentrically with respect to their axes, arms extending from the paddle blades and engageable in the grooves in the guide members whereby on the rotation of the  
 15 rear wheels the said paddle blades will be actuated for the driving of the machine, means for driving the rear wheels, and means for shifting the guide members for changing the disposition of the paddle blades.
- 20 4. A device of the class described comprising a frame, front and rear wheels journaled in said frame, guide members mounted between the rear wheels and swingingly connected with their axis, the said guide mem-  
 25 bers being eccentrically disposed with respect to the axis of the rear wheels and having circular guide grooves therein, a plurality of paddle blades pivotally mounted concentrically with respect to their axes, arms ex-  
 30 tending from the paddle blades and engageable in the grooves in the guide members whereby on the rotation of the rear wheels the said paddle blades will be actuated for the driving of the machine, means for driv-  
 35 ing the rear wheels, means for shifting the guide members for changing the disposition of the paddle blades, and means for steering the front wheel.
5. A device of the class described compris-  
 40 ing a frame, front and rear wheels journaled in said frame, guide members mounted between the rear wheels and swingingly connected with their axis, the said guide members being eccentrically disposed with  
 45 respect to the axis of the rear wheels and having circular guide grooves therein, a plurality of paddle blades pivotally mounted concentrically with respect to their axes, arms extending from the paddle blades and engageable in the grooves in the guide mem-  
 50 bers whereby on the rotation of the rear wheels the said paddle blades will be actuated for the driving of the machine, means for driving the rear wheels, means for shifting the guide members for changing the dis-  
 55 position of the paddle blades, means for steering the front wheel, and rudder mechanism arranged rearwardly of and connected with the frame and having connection with the last named means.
6. A device of the class described compris-  
 60 ing a frame, front and rear wheels journaled in said frame, guide members mounted between the rear wheels and swingingly connected with their axis, the said guide  
 65 members being eccentrically disposed with respect to the axis of the rear wheels and having circular guide grooves therein, a plurality of paddle blades pivotally mounted concentrically with respect to their axes, 70  
 arms extending from the paddle blades and engageable in the grooves in the guide members whereby on the rotation of the rear wheels the said paddle blades will be ac-  
 75 tuated for the driving of the machine, means for driving the rear wheels, means for shifting the guide members for changing the disposition of the paddle blades, means  
 80 for steering the front wheel, rudder mechanism arranged rearwardly of and connected with the frame and having connection with the last named means, and means for raising and lowering the rudder mechanism.
- In testimony whereof I affix my signature in presence of two witnesses.

MILTON M. MALLORY.

Witnesses:

B. A. TUTTEN,  
 J. P. FRY.



B. C. MATABAN.  
MARINE VELOCIPEDE.  
APPLICATION FILED JULY 31, 1913.

1,112,712.

Patented Oct. 6, 1914.  
3 SHEETS—SHEET 1.

Fig. 1.

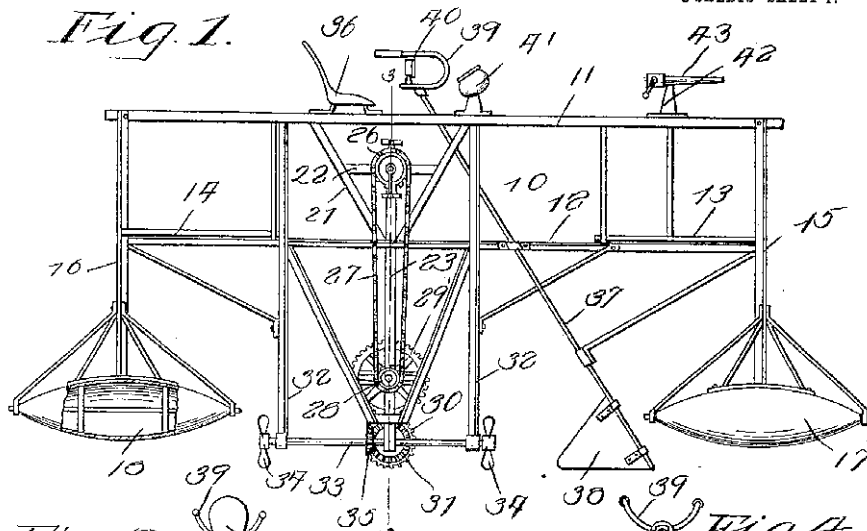


Fig. 2.

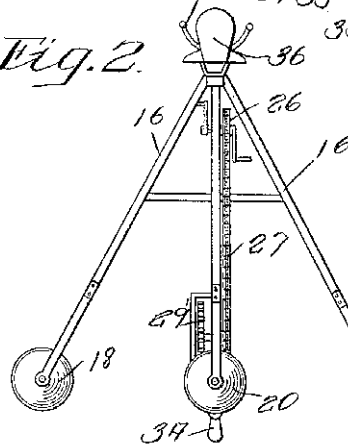


Fig. 4.

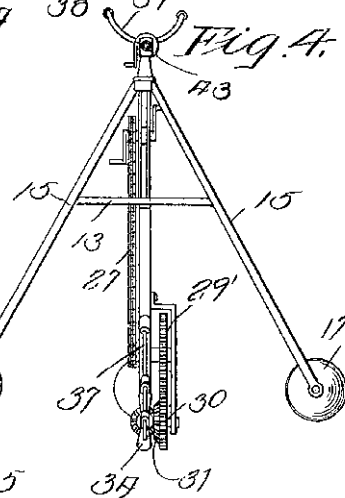
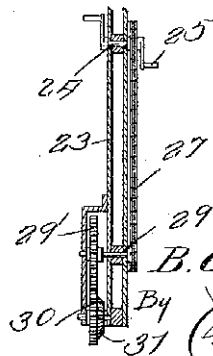


Fig. 3.



Witnesses  
*[Signature]*  
*[Signature]*

Inventor  
B. C. Mataban  
By *[Signature]* Attorneys



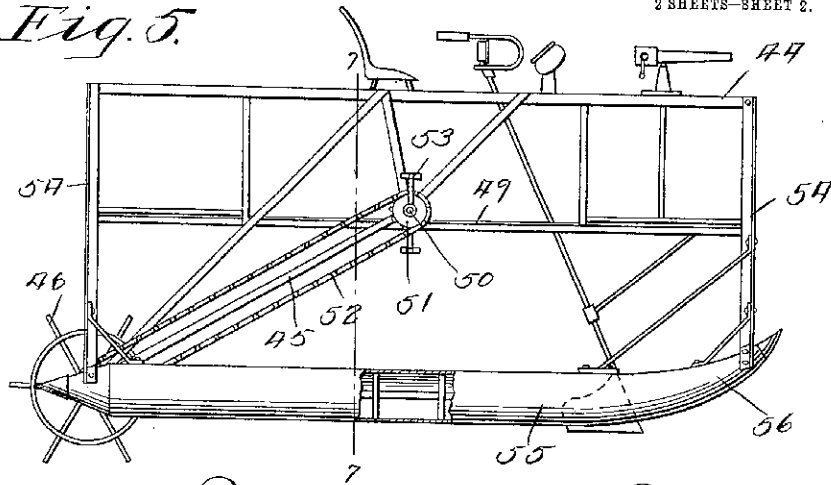
B. C. MATABAN.  
MARINE VELOCIPEDE.  
APPLICATION FILED JULY 31, 1913.

1,112,712.

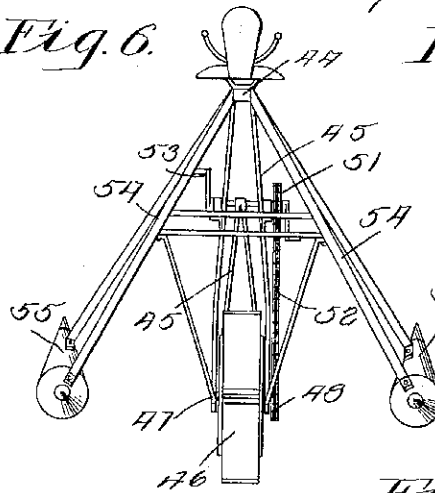
Patented Oct. 6, 1914.

2 SHEETS—SHEET 2.

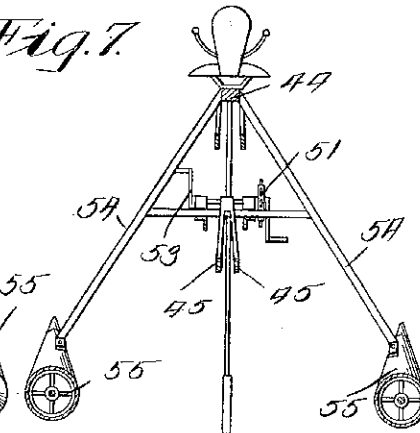
*Fig. 5.*



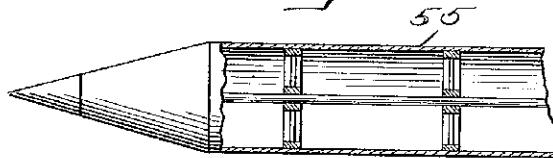
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



Witnesses  
*B. C. Mataban*  
*S. C. Mataban*

Inventor  
*B. C. Mataban*  
By *Chambers Chambers*  
Attorneys

# UNITED STATES PATENT OFFICE.

BENITO C. MATABAN, OF SEATTLE, WASHINGTON.

MARINE VELOCIPED.

1,112,712.

Specification of Letters Patent.

Patented Oct. 6, 1914.

Application filed July 31, 1913. Serial No. 792,235.

*To all whom it may concern:*

Be it known that I, BENITO C. MATABAN, a citizen of the Philippine Islands, residing at Seattle, in the county of King, State of Washington, have invented certain new and useful Improvements in Marine Velocipedes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to marine velocipedes and has for an object to provide a device of this character which will be extremely simple in construction, strong and durable and highly efficient in use.

Another object is to generally improve and simplify the construction of devices of this character and increase the strength and efficiency thereof.

With these and other objects in view, this invention resides in the novel features of construction, formation, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawing, in which:—

Figure 1 is an elevational view of the preferred form of my device. Fig. 2 is a rear view thereof. Fig. 3 is a sectional view on line 3—3 of Fig. 1. Fig. 4 is a rear view of the device. Fig. 5 is a view similar to Fig. 1 showing a modified form of the device. Fig. 6 is a rear view thereof. Fig. 7 is a sectional view on line 7—7 of Fig. 5. Fig. 8 is a fragmentary cross sectional view through one of the pontoons.

Referring to the drawing, the numeral 10 designates a frame, which consists of upper and lower horizontal bars 11 and 12, respectively, the latter supporting the front and rear platforms 13 and 14. Connected at their upper ends to the opposite ends of the bar 11 are divergently arranged bars 15 and 16, respectively, the same being braced intermediate their ends by their connection with the platforms 13 and 14. The lower ends of the bars 15 and 16 are provided with sheet metal pontoons 17 and 18, respectively. Arranged between the bars 16 is a vertical bar 19 which supports a similar pontoon 20.

Connected between the bars 11 and 12 is a frame 21 to the cross bar 22 of which are connected the upper ends of the plates 23, a shaft 24 being passed through the plates 23, and bar 22, said shaft being provided

upon its ends with pedals 25. Fixed to the shaft 24 is a sprocket 26, around which passes a sprocket chain 27 which also engages the sprocket wheel 28 fixed to the shaft 29, said shaft being supported near the lower ends of the plates 23.

Fixed to the shaft 29 is a gear 29' which meshes with the gear 30 which is supported at the lower end of the plate 23 and has one of its faces provided with a beveled gear 31. A pair of hangers 32 are provided and support at their lower ends a shaft 33, upon the opposite ends of which are fixed propellers 34, said shaft having fixed thereto a beveled gear 35 which meshes with the gear 31 so that when the shaft 24 is rotated by the operator upon the seat 36 rotary movement will be imparted to the shaft 33, thus rapidly rotating the propellers 34 so as to propel the device.

Disposed diagonally in relation to the bars 11 and 12 is a shaft 37, the lower end of which is provided with a rudder 38, while the upper end is provided with handle bars 39, which are disposed in convenient relation to the seat 36. Mounted upon the handle bars 39 is a search light 40, while mounted upon the bar 11 is a compass box 41. Mounted near the forward end of the bar 11 is a support 42 upon which is mounted a rapid fire gun 43 which can be operated by a person standing on the platform 13.

Referring to Figs. 5, 6, 7 and 8, there is shown a frame 44 which is constructed in a manner similar to the frame 10 of the preferred form with the exception that the pontoon 20 is eliminated and hangers 45 provided which support at their lower ends a paddle wheel 46 which has its shaft 47 provided with a sprocket 48. Supported above the lower horizontal bar 49 is a shaft 50 to which is fixed a sprocket 51, a sprocket chain 52 being trained around the sprockets 48 and 51 so as to impart rotary movement to the paddle wheel 46 when the sprocket 50 is operated through the medium of the pedals 53.

Connected to the lower ends of the bars 54 are the opposite ends of the sheet metal pontoons 55, the forward ends of which are curved upwardly, as at 56, so as to facilitate the travel of the machine through the water.

From the foregoing description it will be seen that I have provided a marine veloci-

pede, which can be easily propelled through the water and will serve to transport sailors from a gun boat to the land or up small creeks where it is necessary to  
5 navigate with comparatively little noise.

What is claimed is:—

A marine velocipede comprising a main frame work including parallel longitudinal bars disposed one above the other, pontoon  
10 carrying bars extending from the longitudinal bars, plates depending from the longitudinal bars, a shaft supported by the upper ends of the plates, a sprocket wheel fixed to the shaft, a second shaft supported by the  
15 lower ends of the plates, a gear and sprocket fixed to the respective ends of said shaft, a second gear supported by the plates and in

mesh with the first named gear, hangers supported by the main frame, and a shaft supported by the hangers, and means connect- 20 ing the last named gear and shaft for rotating the latter, a sprocket chain trained around the sprockets, means for rotating the first named sprocket, propeller blades fixed to the ends of the horizontally supported 25 shaft, rotary movement being imparted thereto upon operation of the sprocket chain.

In testimony whereof, I affix my signature, in the presence of two witnesses.

BENITO C. MATABAN.

Witnesses:

A. P. HILL,

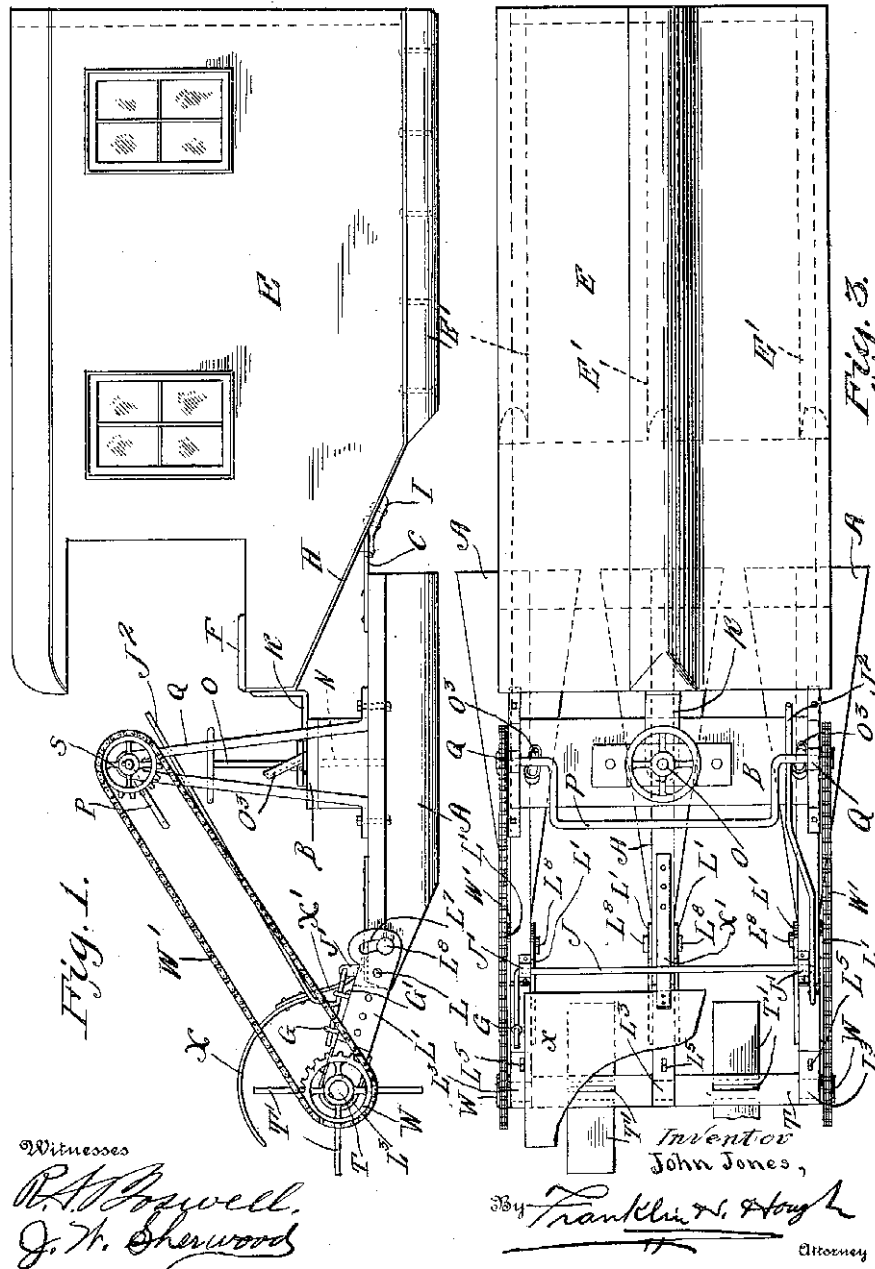
JOSEPH M. MITCHELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

J. JONES.  
WATER CYCLE.  
APPLICATION FILED SEPT. 29, 1914.

1,138,571.

Patented May 4, 1915.  
2 SHEETS—SHEET 1.



Witnesses  
R. A. Boswell,  
J. H. Sherwood

Inventor  
John Jones,  
By Franklin W. Hough  
Attorney

WATER CYCLE.

Patented May 4, 1915.

2 SHEETS—SHEET 2.

Witnesses

R. A. Fossell.  
J. M. Sherwood

Fig. 4.

Fig. 5. 47

[illegible]

Fig. 2.

Inventor

John Jones,

Franklin D. Hoag

Attorney

## UNITED STATES PATENT OFFICE.

JOHN JONES, OF BOKHOMA, OKLAHOMA.

## WATER-CYCLE.

1,138,571.

Specification of Letters Patent.

Patented May 4, 1915.

Application filed September 29, 1914. Serial No. 864,112.

*To all whom it may concern:*

Be it known that I, JOHN JONES, a citizen of the United States, residing at Bokhoma, in the county of McCurtain and State of Oklahoma, have invented certain new and useful Improvements in Water-Cycles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in water cycles and comprises a simple and efficient apparatus of this nature, having various details of construction, combinations and arrangements of parts which will be hereinafter fully described, shown in the accompanying drawings and then specifically defined in the appended claims.

My invention is illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of my improved water cycle. Fig. 2 is a front view. Fig. 3 is a top plan view, and Fig. 4 is a bottom plan view of the apparatus. Fig. 5 is a perspective view of the propelling mechanism.

Reference now being had to the details of the drawings by letter, A, A designate a series of buoyant runners, made preferably of cork or other buoyant material, and which are fastened together by means of the plate B having a curved segment C secured to the upper surfaces of the outer of said buoyant runners. E designates a car which has a seat F and the forward end of said car is cut away as at H and has buoyant and tapering guide strips E' projecting from the bottom thereof and serving to prevent the car from drifting or moving sidewise. I designates a bracket arm fastened to said inclined portion and adapted to bear against the under surface of said curved segment C and serving as a means for preventing the runners from tilting independent of a car and still allowing the runners to turn for the purpose of steering the apparatus.

An angled plate K is fastened at one end to the forward end of the car and its other end is pivotally connected to the king bolt N secured to the plate B. A steering shaft O is fixed to the plate B and has a wheel O'

at its upper end forming a convenient means for turning the runners which are fixed together. Foot steering plates, designated by letter O<sup>2</sup>, are fastened one near each of said standards Q and serve as means whereby the operator pushing upon one or the other may assist in steering the craft. Standards Q, with their lower ends angled, are fastened to and rise from the runners and a crank shaft P is journaled in said standards to which the sprocket wheels S are fixed.

Pivotally mounted upon the pins L carried near the forward ends of the runners are the slotted plates L', the shank portions of which are fastened upon the opposite sides of the bars L<sup>2</sup> and which latter have the straps L<sup>3</sup> bent over the ends of the bars and held by means of keys L<sup>4</sup> passing through registering slots in the straps and slots in the bars and cooperate with concaved ends of the bars to form bearings for a propeller shaft T, having blades T' fixed thereto. The rear ends of the plates L' have curved slots L' formed therein, and pins L<sup>5</sup> projecting from the opposite sides of the runners pass through said curved slots and serve to guide the plates L' as the latter are tilted upon their pivots. Sprocket wheels W are fixed to the shaft T and chains W' pass about said sprocket wheels and the sprocket wheels S before referred to, forming means whereby, as the crank shaft is rotated, a rotary movement may be imparted to the shaft carrying the propeller blades.

An angled shaft, designated by letter J, is journaled in suitable bearings J' projecting from the upper surface of the outer of the runners and one angled end of the shaft J engages an eye G upon one of the bars L<sup>2</sup>, while an angled portion of the shaft engages another eye G' upon the bar at the opposite side and the bar is bent at an inclination to form a handle J<sup>2</sup> in convenient reach of the operator positioned near the steering wheel. A fender X is mounted upon a bar X' and extends over the propeller blades.

The operation of my invention will be readily understood and is as follows: The propeller shaft is rotated by the rotation of the crank shaft or, if preferred, a motor of any construction might be connected to the propeller shaft for rotating the same. The series of bars L<sup>2</sup> carrying the propeller shaft may be raised and lowered by the rocking of the shaft J to cause the propeller blades to

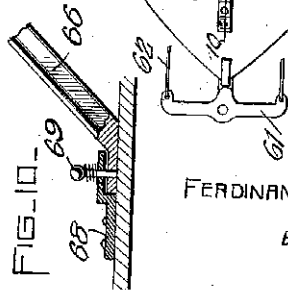
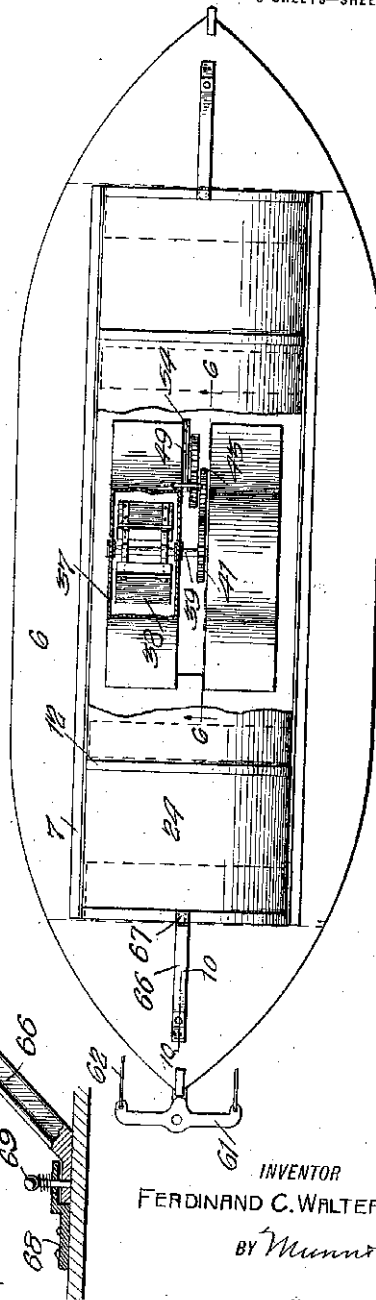
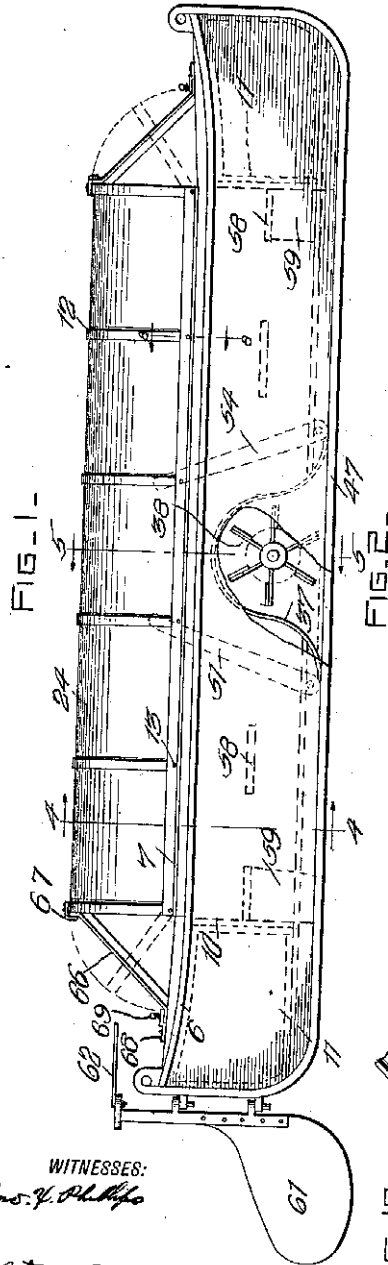
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F. C. WALTER.  
LIFE BOAT.  
APPLICATION FILED JUNE 22, 1915.

1,185,561.

Patented May 30, 1916.

3 SHEETS—SHEET 1.



WITNESSES:  
*Jos. F. Phillips*  
*Alvin T. Garner*

INVENTOR  
FERDINAND C. WALTER,  
BY *Munn & Co.*  
ATTORNEYS



1,185,561.

F. C. WALTER.  
LIFE BOAT.  
APPLICATION FILED JUNE 22, 1915.

Patented May 30, 1916.  
3 SHEETS—SHEET 2.

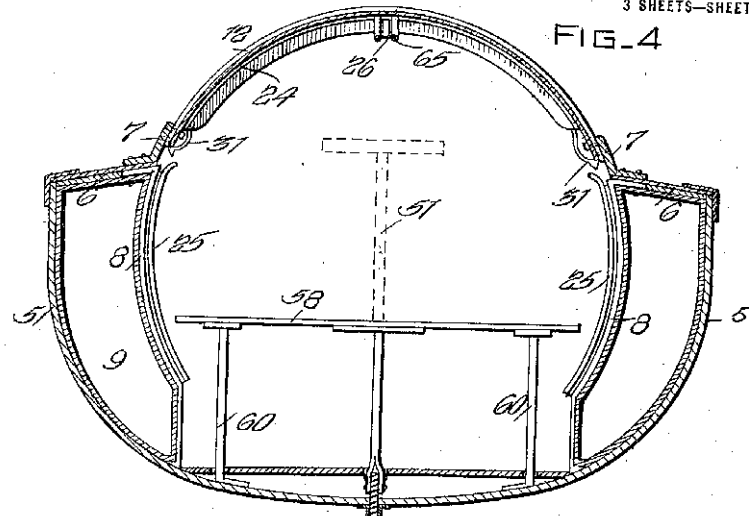


FIG. 4

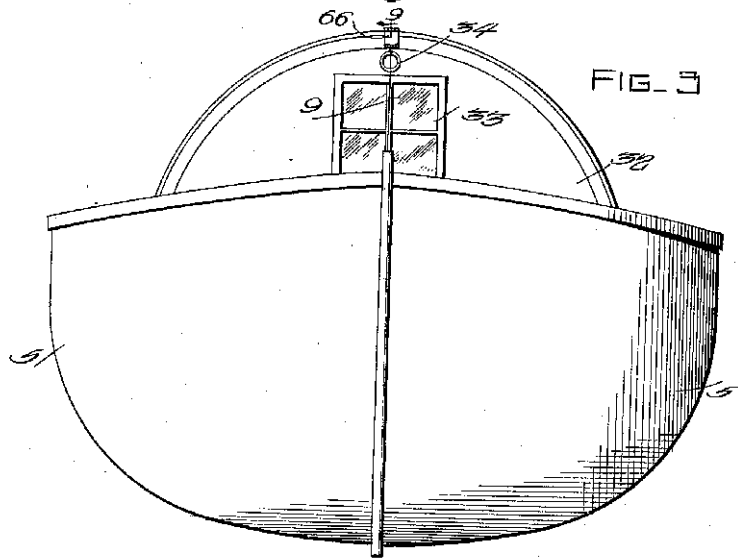


FIG. 3

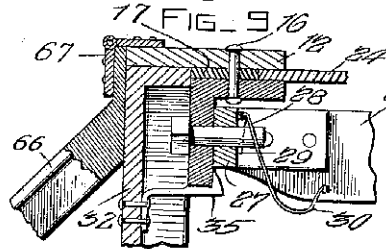


FIG. 9

WITNESSES:  
*John F. Phillips*  
*Alvin F. Garner*

INVENTOR  
FERDINAND C. WALTER,  
BY *Munn & Co.*  
ATTORNEYS

F. C. WALTER.  
LIFE BOAT.  
APPLICATION FILED JUNE 22, 1915.

1,185,561.

Patented May 30, 1916.  
3 SHEETS—SHEET 3.

FIG. 5.

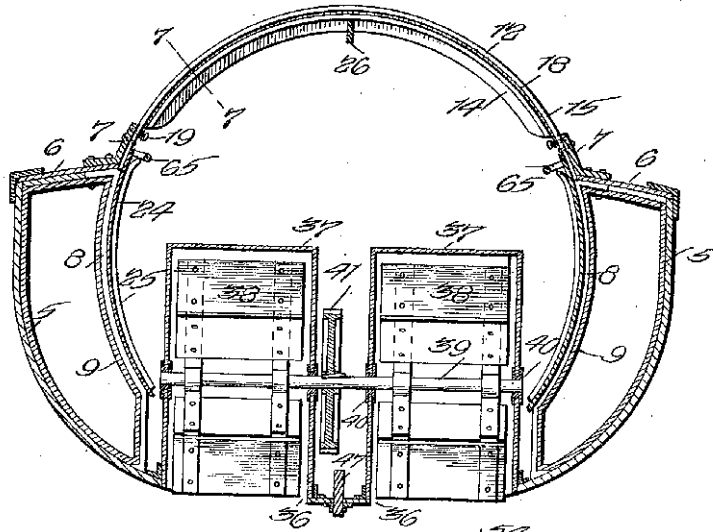


FIG. 6.

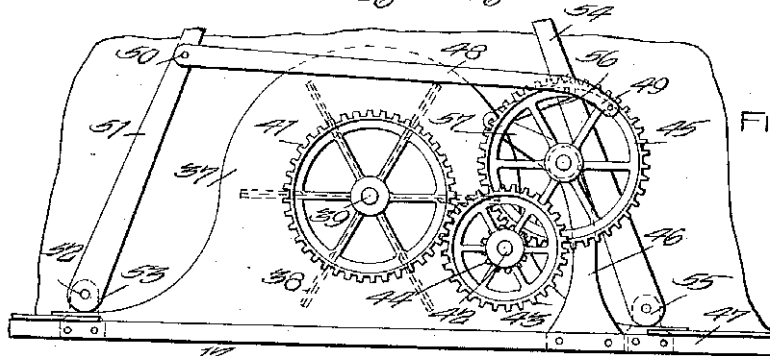


FIG. 7.

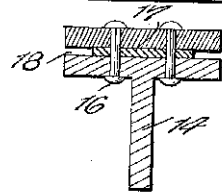
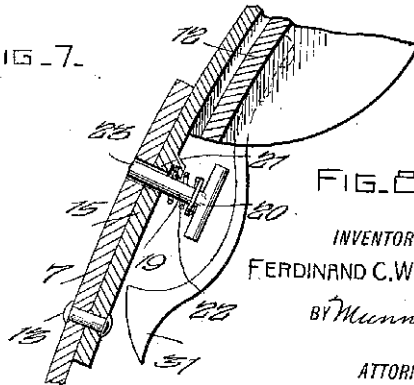


FIG. 8.



WITNESSES:

*Jos. H. Phillips*

*Alvin F. Garner*

INVENTOR

FERDINAND C. WALTER,

BY *Munn & Co.*

ATTORNEYS

# UNITED STATES PATENT OFFICE.

FERDINAND CARL WALTER, OF WINTHROP HARBOR, ILLINOIS.

## LIFE-BOAT.

1,185,561.

Specification of Letters Patent.

Patented May 30, 1916.

Application filed June 22, 1915. Serial No. 35,561.

*To all whom it may concern:*

Be it known that I, FERDINAND C. WALTER, a citizen of the United States, residing at Winthrop Harbor, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Life-Boats, of which the following is a specification.

This invention relates to an improvement in boats and more particularly to an improvement in life boats.

One of the principal objects of the invention is to provide an improved life boat having means whereby it may very readily and quickly be covered so as to render the boat wave and storm proof.

Another object of the invention is to provide a life boat having a plurality of shield sections which may be raised for completely covering the boat, in order to protect passengers from storm and from the waves.

Still another object of my invention is to provide an improved mechanism whereby the boat may be manually driven without the use of oars.

Still another object of the invention is to provide an improved life boat of the class described which will be extremely simple, durable, efficient in operation and inexpensive to manufacture.

With these and other objects in view which will become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawing, in which like characters of reference indicate like parts throughout the several figures, of which—

Figure 1 represents a side elevational view of a life boat constructed according to my invention. Fig. 2 represents a top plan view thereof. Fig. 3 represents an end elevational view thereof. Fig. 4 represents a vertical transverse sectional view taken on the plane indicated by the line 4—4 of Fig. 1 looking in the direction of the arrows. Fig. 5 represents a similar view taken on the plane indicated by the line 5—5 of Fig. 1 looking in the direction indicated by the arrows. Fig. 6 represents a side elevational view of the transmission mechanism for the paddle wheels. Fig. 7 represents a detail transverse sectional view taken on the plane indicated by the line 7—7 of Fig. 5. Fig. 8

represents a detail sectional view taken on the plane indicated by the line 8—8 of Fig. 1 looking in the direction indicated by the arrows. Fig. 9 represents a view in section taken on the plane indicated by the line 9—9 of Fig. 3 looking in the direction indicated by the arrows. Fig. 10 represents a fragmentary vertical sectional view taken on the plane indicated by the line 10—10 of Fig. 2.

In carrying out my invention I provide a boat having a hull 5 formed of suitable sheet metal, the boat being provided with a flush deck 6. A coaming 7 formed of suitable angle iron extends around the inner edge of deck 6. The deck at its inner edge along the sides of the boat is connected by the longitudinal partitions or bulheads 8 with the bottom of the hull 5, whereby spaces are defined in which air tanks 9 are inserted on opposite sides of the boat. The ends of the boat are provided with transverse bulkheads 10 in which air chambers 11 are inserted.

At spaced points along the length of the boat, are provided the shield plate guides 12. These guides are pivoted at their ends to the coaming as at 13. The guides are arcuate in form and when the boat is not in use, are swung downwardly to lie in substantially horizontal positions. As shown in Fig. 7, each guide comprises a length of T-iron 14 to the base flange of which a metallic strip 15 is secured, by means of rivets or other fastenings 16, the said strip 15 being spaced from the T-iron by means of a spacer strip 17. In this manner, a channel or guideway 18 is provided on each side of the T-iron. I may if desired employ channel iron in the place of the T-iron without departing from the invention.

In order that the plate guides when moved into vertical position may be maintained against accidental displacement, I provide a spring latch indicated in Fig. 8. This latch constitutes a pin 19 having a handle 20 whereby the pin may be operated. The pin extends through an opening 21 in the strip 15 near the lower end of the same, and is provided with a spring 22 normally tending to force the pin outwardly so that when the guide attains vertical position, pin 19 in coming opposite an opening 23 provided in the coaming will, by action of said spring, be projected into the opening so as to maintain the guide in upright position.

The guides 12 are adapted to act as guideways for a plurality of shield plates 24. These plates are arranged in equal numbers on opposite sides of the boat and are curved to such a degree as to conform to the curvature of guides 12. The plates are each of a length equal to the distance between two adjacent guides. As indicated in Fig. 5 the plates normally lie along the sides of the boat against the partitions or bulk heads 8, being maintained in place by the lower guides 25 which are disposed immediately below guides 12 and in such position that when the latter are raised the guides 25 will be in alinement with them. As indicated the bulk heads 8 are preferably curved or concaved to conform to the curvature of plates 24 and similarly guides 25 are also curved. Normally the plates 24 are in lowered position and the guides 12 are folded down in horizontal position, but when the boat is to be used said guides are raised into vertical position, and are braced in position by means of the spring actuated pins 19, and also by a tie-rod 26 which engages the T-irons at right angles thereto and extends longitudinally of the boat. It is provided as indicated in Fig. 9 at its ends with angles 27 which abut against the vertical flange of the end guides 12. The angles 27 and the end braces 12 are provided with registering openings through which pins 28 may be passed for securing the tie-rod in position, said pins adapted to have wedges 29 inserted through openings therein within the angle 27 so as to secure the parts in position. The wedges may be connected by means of flexible elements 30 to the tie-rod 26 so as to prevent their loss. The guides 12 and the tie-rod having been secured in position, plates 24 are then raised out of the guides 25 and are shifted upwardly within guides 12 until they gain the position indicated in Fig. 4. Plates 24 are provided with suitable handles 35 by means of which they may readily be raised. These handles may be positioned near the ends of the plates so as to rest against the upper ends of guides 25 when the plates are lowered, to limit the downward movement of said plates.

The plates 24 may be maintained in raised position by any suitable means, for instance, by having spring latches 31 provided on guides 12 and adapted to be engaged and hooked under the lower edges of the plates 24 when the latter are raised. The ends of the covering or shield are in the form of a pair of frames indicated generally at 32, which are hinged to the deck or to the ends of the coamings whereby they may be raised from a normal horizontal position when the shield is open, upwardly through the dotted line position indicated in Fig. 1 into vertical planes so as to completely close the

casing or covering. The frames are shown in front elevation in Fig. 3, and it will be noted that they carry doors 33 which may have heavy glass panes, the doors being adapted to swing outwardly when desired so as to allow means of ingress and egress to the occupants of the boat. Port holes indicated at 34 are also provided in the frame. As indicated in Fig. 9, the frames each carry a spring latch 35 adapted to engage the end guideways 12 for maintaining the frames in raised position. In order to brace the end frames in vertical position, each of them has a brace 66 in the form of a T-iron or channel iron hingedly connected at one end to the end frame by means of hinges 67. The ends of the brace are bent angularly with respect to the body portion thereof as shown, and the outer end of the brace is adapted as indicated in Fig. 10, to be engaged in a cleat 68 secured to the deck of the boat. This cleat is provided with a spring-actuated pin 69 which engages through an opening in the outer end of the brace in the manner shown. When the frames are to be folded down, the pins 69 are raised manually and the braces withdrawn from beneath the cleats, and are then folded back over the end frame, so that the latter may lie flat on the deck. These braces serve to strengthen the boat covering, and to rigidly maintain it in place against the battering and pounding of the waves.

The bottom of the hull amidships and on each side of the medial line is provided with openings at 36. These openings are bridged by the casings or housings 37 which are formed of a suitable metal and are connected in a suitable manner to the bottom of the hull so as to form water-tight joints. The casings form tunnels on each side of the medial line of the boat for the reception of the paddle wheels 38. The latter are fast upon a shaft 39 which extends transversely of the boat and is journaled in the boxings 40 carried by the casings or tunnels 37. Upon the shaft 39 is keyed a cog wheel 41. A countershaft 42 is journaled in parallel relation to shaft 39 in the adjacent walls of the two casings, and on this shaft is keyed a pinion 43 which meshes with cog wheel 41. A smaller pinion 44 is also keyed on shaft 42 in spaced relation to pinion 43, and meshing with this smaller pinion is a larger gear wheel 45. The latter is journaled in a bracket 46 secured in any suitable manner to the keel 47. A bar 48 is pivoted at 49 to gear wheel 45 near the periphery of the latter, and at its opposite end is pivoted to a hand lever 51. The latter is pivotally connected at 52 to a bracket 53 secured upon the keel 47. A second hand lever 54 is pivoted to a bracket 55 likewise secured to keel 47 at the opposite end of the tunnels from

the end at which lever 51 is disposed. To this lever 54 is pivotally connected one end of a link 56, the opposite end of which is pivoted to a crank arm 57 secured to a stub shaft on which gear 45 is carried.

The crank arm 57 extends at right angles to the radius in which the pivot point 49 lies, so that as the hand levers are worked back and forth by the occupants of the boat, in driving the paddle wheels 38, the danger of dead centering the transmission will be eliminated. The ratio of the various gears in the train is such that the paddle wheels will be driven at a greater rate of speed than gear 45 is driven, so that by operating the latter at a moderate rate the boat will be propelled at a good pace. It will be noted that the tunnels are inclosed on their opposite sides, so that there will be no danger of drifting ice or debris becoming engaged with the paddle wheels.

Arranged at suitable points within the boat is a plurality of seats 58 for the accommodation of the passengers. Suitable receptacles may be disposed beneath the seats or at other desirable points as indicated at 59 for the reception of foodstuffs and water. The seats may be carried by standards 60 secured to the bottom of the hull. A rudder 61 is hung at one end of the boat, and may be operated from within the latter by means of suitable flexible elements 62.

Such a boat as I have provided may be constructed entirely of metal, unless it be deemed advisable to have the flooring and seats made of wood. The shield is very quickly and readily raised into place and the end frames raised for entirely closing the boat to protect its passengers from rain or wind, and to protect the boat from waves which might break over the same. The natural heat of the passengers will serve to maintain the temperature at a desirable degree, even in the coldest weather, ventilation being had through the ports 34 or through the doors 33 by partially opening the latter if desired. Such a boat will be extremely staunch and seaworthy, and through the medium of the propelling mechanism I have provided, may be operated without the use of oars and from within the boat, and without danger of having the operating mechanism broken or disabled by contact with floating cakes of ice or other obstacles. By providing the coöperating attaching means between the guides and the shield plates and the end walls or closure, the boat may be put in position to withstand the severest storms in an extremely short time and by any persons of ordinary intelligence without particular knowledge of its construction.

Although I have described the preferred embodiment of my invention, I may desire to make such changes in the construction,

combination, and arrangement of parts thereof, as do not depart from the spirit of the invention and the scope of the appended claims.

I claim:—

1. An open boat having a plurality of curved guides pivotally connected at spaced intervals thereto and adapted to be raised into vertical position, means for maintaining said guides in vertical position, a plurality of curved plates normally disposed within the boat below the decks thereof, lower guideways in which said plates are slidably maintained, first said guides when raised being in alinement with said lower guides, means for raising said plates upwardly within the first said guides, means for maintaining said plates in raised position, a closure hingedly connected to the boat near each end and adapted to be raised into vertical position and into engagement with the end guides, means for maintaining said closures in raised position, braces pivotally connected to the end guides and adapted to be detachably connected with the boat, doors provided in said end closures, ports also provided in said end closures, and means for propelling said boat by hand from within the same.

2. An open boat having a plurality of guides hingedly connected to said boat and adapted to be raised into vertical position, a plurality of cover plates slidably disposed within the boat and adapted to be raised within said guides to form a covering for the boat, means for maintaining said plates in raised position, closures hingedly connected to the boat near the ends of the covering and adapted to be raised into position for closing the ends of the covering, means for maintaining said closures in closed position, means for bracing the closures in closed position, and doorways provided in the end closures.

3. The combination with an open boat, of a plurality of guide ways hingedly connected thereto and adapted to be moved into vertical position, a plurality of plates normally housed within the boat and adapted to be raised within the guideways for forming a covering, a tie-rod adapted to be engaged with said guideways for bracing them, means for securing said tie-rod in place, means for securing said plates in place, closures adapted to be disposed at the ends of the covering for closing the same, said closures being provided with doorways therein and means for maintaining the closures in position.

4. The combination with an open boat, of a plurality of guideways movable into supporting and non-supporting positions, a plurality of cover plates adapted to be moved into engagement with the guideways for forming a cover for the boat, closure means

for closing the ends of the cover, and means for supporting the guideways, the cover plates and closure means in position.

5 5. An open boat having a plurality of spaced curved guides movable into supporting and non-supporting positions, means for maintaining the guides in supporting position, a tie rod adapted to be positioned for engaging the guides when the latter are in supporting position, means whereby the tie rod may be detachably connected with certain of the guides for retaining it in position, a plurality of cover plates movable into the guides when the latter are in supporting position for forming a cover for the boat, means for supporting the plates in cover forming position, end closures having ventilating and observation means and movable into position for closing the ends of the cover, and means for supporting the end closures in position for closing the ends of the cover.

6. The combination with an open boat, of a plurality of guide-ways movable into supporting and non-supporting positions, a plurality of cover plates adapted to be moved into the guide-ways when the latter are in supporting position for forming a cover for the boat, and latches carried by the guideways for supporting the cover plates in cover forming position.

7. The combination with an open boat, of a plurality of guides formed in the sides

thereof, a plurality of cover plates slidably received by the guides, a plurality of guide-ways movable into position for alining with the guides whereby the plates may be moved from said guides into the guide-ways for forming a cover for the boat.

8. The combination with an open boat, of a sectional cover movable into position for covering the boat, said cover including end closures hingedly connected with the boat, means for maintaining and bracing the end closures in position for closing the ends of the cover, said means including braces connected with the closures, cleats supported by the boat adapted to be engaged by the braces, and means for detachably connecting the braces to the cleats.

9. An open boat having a plurality of guideways hingedly connected thereto, means whereby the guideways may be supported in raised position, a plurality of cover plates adapted to be moved into the guide-ways for forming a cover for the boat, means for closing the ends of the cover, means for supporting the cover plates in cover forming position, and means within the boat whereby it may be propelled by hand.

FERDINAND CARL WALTER.

Witnesses:

EMMA WALTER,  
ARTHUR WALTER,  
FREDERICK BALE.



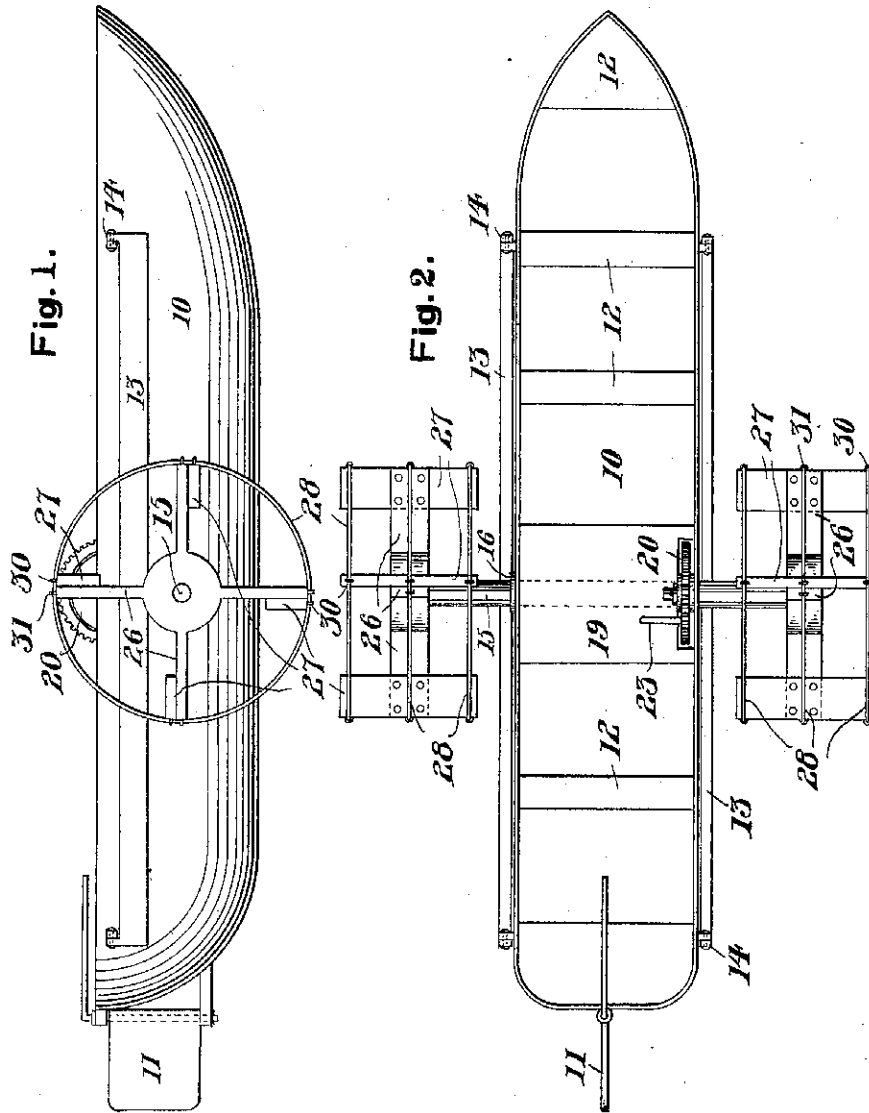
M. ZARADZKI.  
LIFE BOAT.

APPLICATION FILED MAY 7, 1915. RENEWED FEB. 9, 1917.

1,238,244.

Patented Aug. 28, 1917.

2 SHEETS—SHEET 1.



Inventor  
M. Zaradzki

*A. M. Wilson*

Attorney



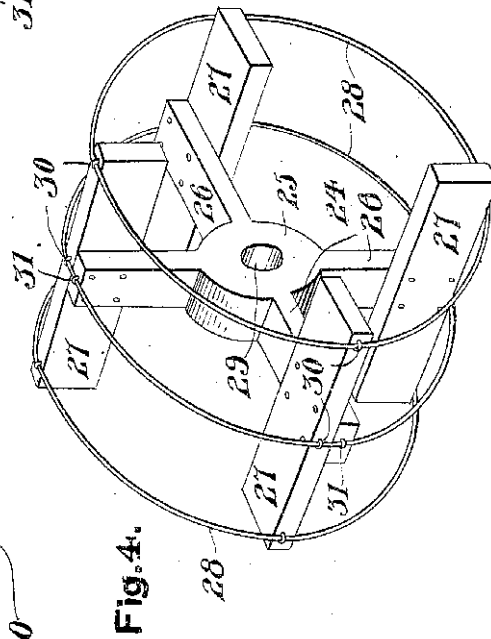
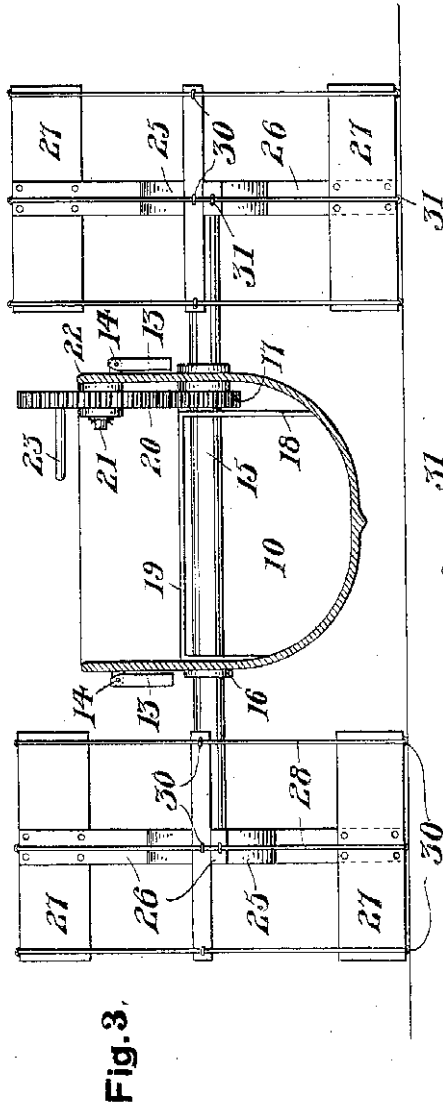
M. ZARADZKI.  
LIFE BOAT.

APPLICATION FILED MAY 7, 1913. RENEWED FEB. 9, 1917.

1,238,244.

Patented Aug. 28, 1917.

2 SHEETS—SHEET 2.



334

Inventor  
M. Zaradzki

A. M. Wilson

Attorney

# UNITED STATES PATENT OFFICE.

MICHAL ZARADZKI, OF CARNEGIE, PENNSYLVANIA.

## LIFE-BOAT.

1,238,244.

Specification of Letters Patent.

Patented Aug. 28, 1917.

Application filed May 7, 1915, Serial No. 26,538. Renewed February 9, 1917. Serial No. 147,614.

### *To all whom it may concern:*

Be it known that I, MICHAL ZARADZKI, a subject of the Emperor of Austria, residing at Carnegie, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Life-Boats, of which the following is a specification.

This invention relates to certain new and useful improvements in life boats.

The primary object of this invention is the provision of a serviceable life boat especially adapted for employment upon the deck of a vessel and being so arranged that the propelling paddles thereof serve as truck wheels for moving the boat around upon the deck.

A further object of the invention is the provision of a life boat having manually actuated propelling means, such means functionally serving as traction wheels for moving the boat along the ground or over the deck of a vessel as well as paddle wheels when the boat is in the water.

A still further object is to provide a combined wheel and paddle member for a boat, the same being serviceable in propelling the boat through the water and in mounting the same for free movement upon a supporting surface.

With these general objects in view and others that will appear as the nature of the invention is better understood, the same consists in the novel combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

In the drawings forming a part of this application and in which like-designating characters refer to corresponding parts throughout the several views,

Figure 1 is a side elevation of the device.

Fig. 2 is a top plan view thereof.

Fig. 3 is a vertical transverse sectional view thereof.

Fig. 4 is a perspective view of one of the propeller-wheel members detached.

By referring to the drawings, it will be noted that the life boat 10 is provided with substantially the usual form and having a rudder 11 at the stern thereof and with a plurality of seats or thwarts 12 arranged transversely within the boat. Oppositely arranged foldable outriggers 13 are ar-

ranged longitudinally extending hinged as at 14 to the opposite sides of the boat.

A power shaft 15 is transversely journaled through the boat in bearings 16 at the opposite sides thereof, the same being provided with a pinion 17 within the boat and arranged between a support 18 of the operator's seat 19 and the adjacent inner side of the boat. An operating gear 20 is journaled upon a stub shaft 21 inwardly projecting adjacent the gunwale 22 of the boat, the said gear being in constant operative meshing engagement with the pinion 17 and being provided with a turn crank or handle 23 by means of which the gear, pinion and power shaft are revolved.

One of the important features of the present invention resides in the form of combined paddle and traction wheel 24 as best illustrated in Fig. 4, and being operatively arranged one at each opposite side of the boat and fixedly secured to the opposite outer ends of the power shaft 15. Each of the wheels consists of a hub 25 having radially projecting spokes 26 extending therefrom, and having paddle boards 27 secured perpendicularly at the opposite outer ends of the said spokes and extending equal distances upon the lateral sides thereof. Rings or hoops 28 of any desired number, three being herein illustrated, are concentrically arranged with respect to the central journaling opening 29 of the wheel hub 25 and are secured by suitable means such as staples 30 to the outer edges of the boards 27, while the centrally positioned hoop is also secured by staples 31 to the outer ends of the spokes 26.

From this detailed description of the device, the complete operation thereof will be apparent, the boat being normally inoperatively positioned upon the deck of a vessel or upon the ground mounted upon the wheels 24 as best illustrated in Fig. 1, it being understood that either end of the boat being supported, the boat may be readily pushed along upon the said wheels after the manner of a truck and thus readily launched for service. The hinged outriggers 13 will assume their folding position when the boat enters the water and sinks substantially to the depth of the said outriggers. When the boat is in the water, the same is readily propelled in the desired direction by an occupant of the boat seated upon the central

seat 19 and turning the crank 23 which revolves the gear 20 in one direction thus revolving the pinion 17 and the power shaft 15 in an opposite direction and consequently revolving the paddle wheels 24 in the water and forcing the boat along in whichever direction it is desired. This device provides a serviceable life boat adaptable for general application and readily movable upon land and manually operable through the water.

While the form of the invention herein shown and described is what is believed to be the preferred embodiment thereof, it is nevertheless to be understood that minor changes may be made without departing from the spirit and scope of the invention as set forth in the claims.

What I claim as new is:—

1. A life boat provided with a centrally arranged operator's seat, a vertical support therefor, an operating shaft transversely journaled through the said boat and extending through the said support, a pinion secured to the said shaft between the said support and the adjacent side of the boat, an inwardly projecting stub-shaft secured adjacent the gunwale of the boat, an operating gear journaled upon the said stub shaft and in constant operative meshing engagement with the said pinion, an operating handle projecting from the said gear in a plane above the said seat, and combined traction and paddle wheels secured to the opposite outer ends of the said shaft.

2. A life boat provided with a centrally

arranged operator's seat, a vertical support therefor, an operating shaft transversely journaled through the said boat and extending through the said support, a pinion secured to the said shaft between the said support and its adjacent side of the boat, an inwardly projecting stub shaft secured adjacent the gunwale of the boat, an operating gear journaled upon the said stub shaft, and in constant operative meshing engagement with the said pinion, an operating handle projecting from the said gear in a plane above the said seat, paddle wheels secured to the opposite outer ends of the said shaft, and spaced traction hoops outwardly carried by the said paddle wheels and arranged concentric with the said shaft.

3. A combined paddle and traction wheel comprising a hub, radially projecting spokes carried by the said hub, transversely arranged paddle boards secured in flat engagement adjacent the outer ends of the said spokes and extending equal distances laterally thereof, traction hoops equally spaced apart and secured to the outer edges of the said boards and arranged concentric with the said hub, and securing means between the centrally positioned one of the said hoops and the opposite ends of the said spokes.

In testimony whereof I affix my signature.  
MICHAL ZARADZKI.

Witnesses:

A. W. McMILLEN,  
JOHN HOROWICZ.

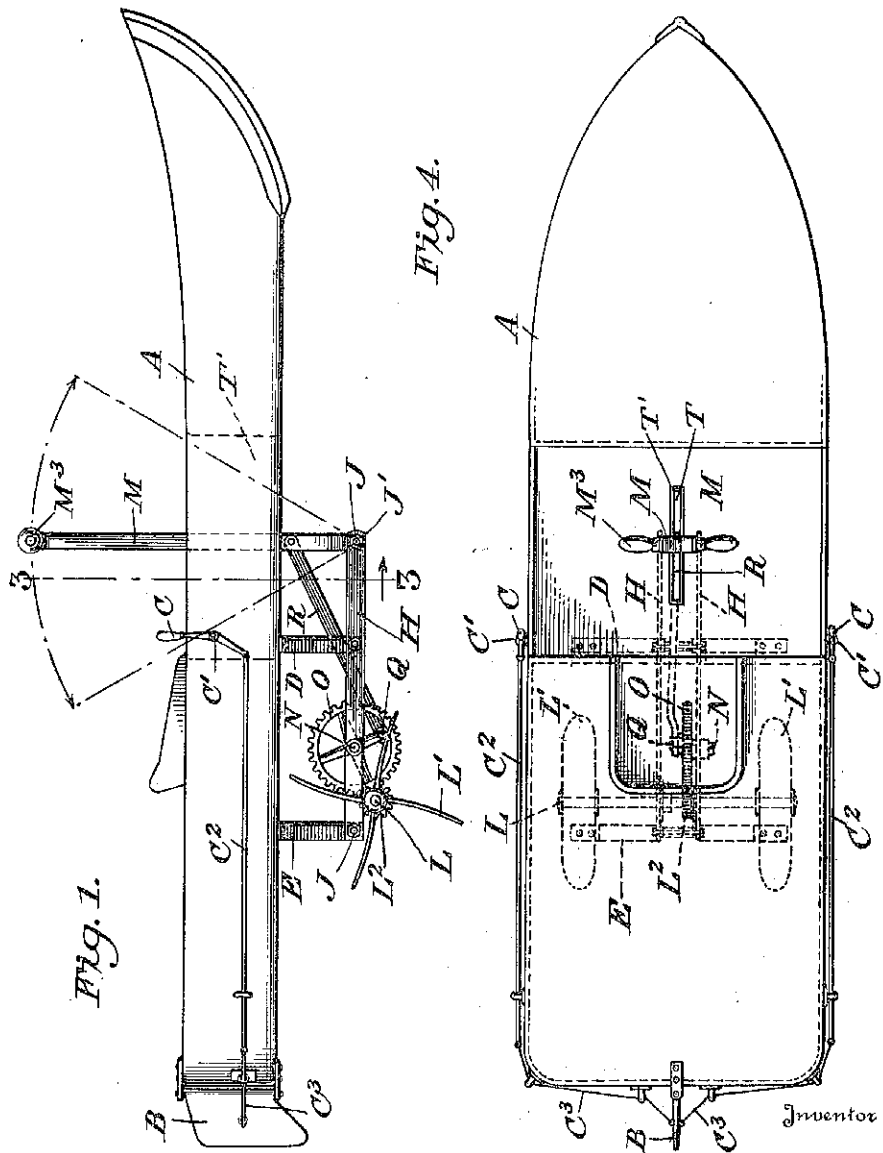
Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

I. MORI.  
MANUALLY OPERATED POWER BOAT.  
APPLICATION FILED APR. 2, 1917.

1,244,068.

Patented Oct. 23, 1917.

2 SHEETS—SHEET 1.



Witnesses  
Genton St. Belt  
A. L. Hough

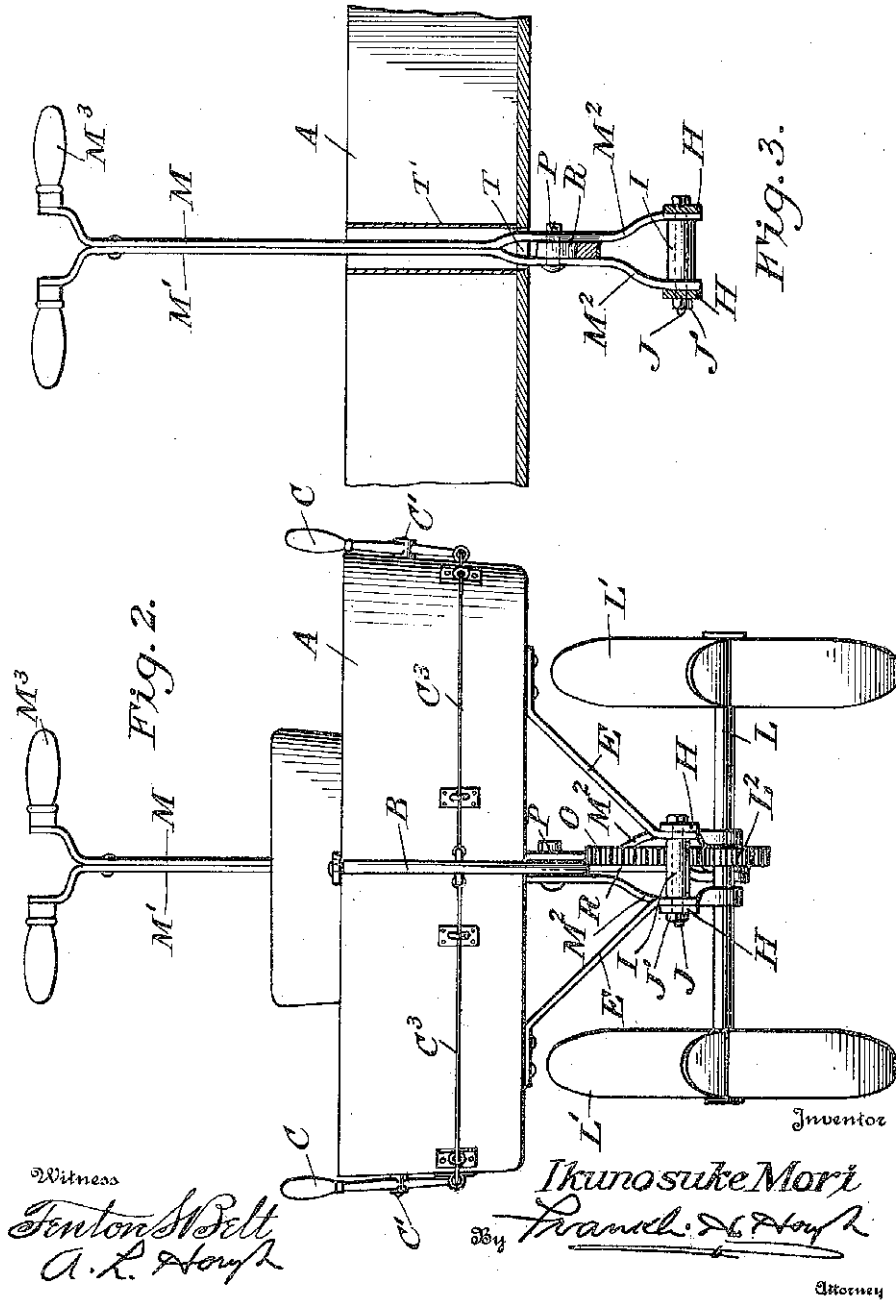
Inventor  
Ikunosuke Mori  
Francis D. Hough  
Attorney

I. MORI.  
MANUALLY OPERATED POWER BOAT.  
APPLICATION FILED APR. 2, 1917.

1,244,068.

Patented Oct. 23, 1917.

2 SHEETS—SHEET 2.



# UNITED STATES PATENT OFFICE.

IKUNOSUKE MORI, OF LOS ANGELES, CALIFORNIA.

MANUALLY-OPERATED POWER-BOAT.

1,244,068.

Specification of Letters Patent.

Patented Oct. 23, 1917.

Application filed April 2, 1917. Serial No. 159,332.

*To all whom it may concern:*

Be it known that I, IKUNOSUKE MORI, a subject of the Emperor of Japan, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Manually-Operated Power-Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful

gear wheel O, the teeth of which mesh with those of the gear wheel L<sup>2</sup> and upon said wheel O is a crank pin Q to which one end of the pitman R is pivoted.

An oscillating operating member comprises two bars M and M' which are fastened together and their lower portions are outwardly curved as at M<sup>2</sup> and the lower ends of said bars are pivotally mounted upon one of the bolts J. Handles M<sup>3</sup> are connected to the upper ends of said bars M and M'. A pivotal pin P is carried by the bars M and M' and between which one end of the pitman R is pivoted. Said bars are mounted in an elongated slot T formed in the bottom of the boat, said slot having a suitable wall

2

1,244,068

a master gear wheel journaled between said bars and in mesh with the gear wheel upon the propelling shaft, a pivotal pin supported by said bars, an oscillating lever pivotally mounted upon said pin, and pitman connections between said lever and master gear wheel.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

IKUNOSUKE MORI.

Witnesses:

MARJORIE R. QUINN,  
R. E. LADY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

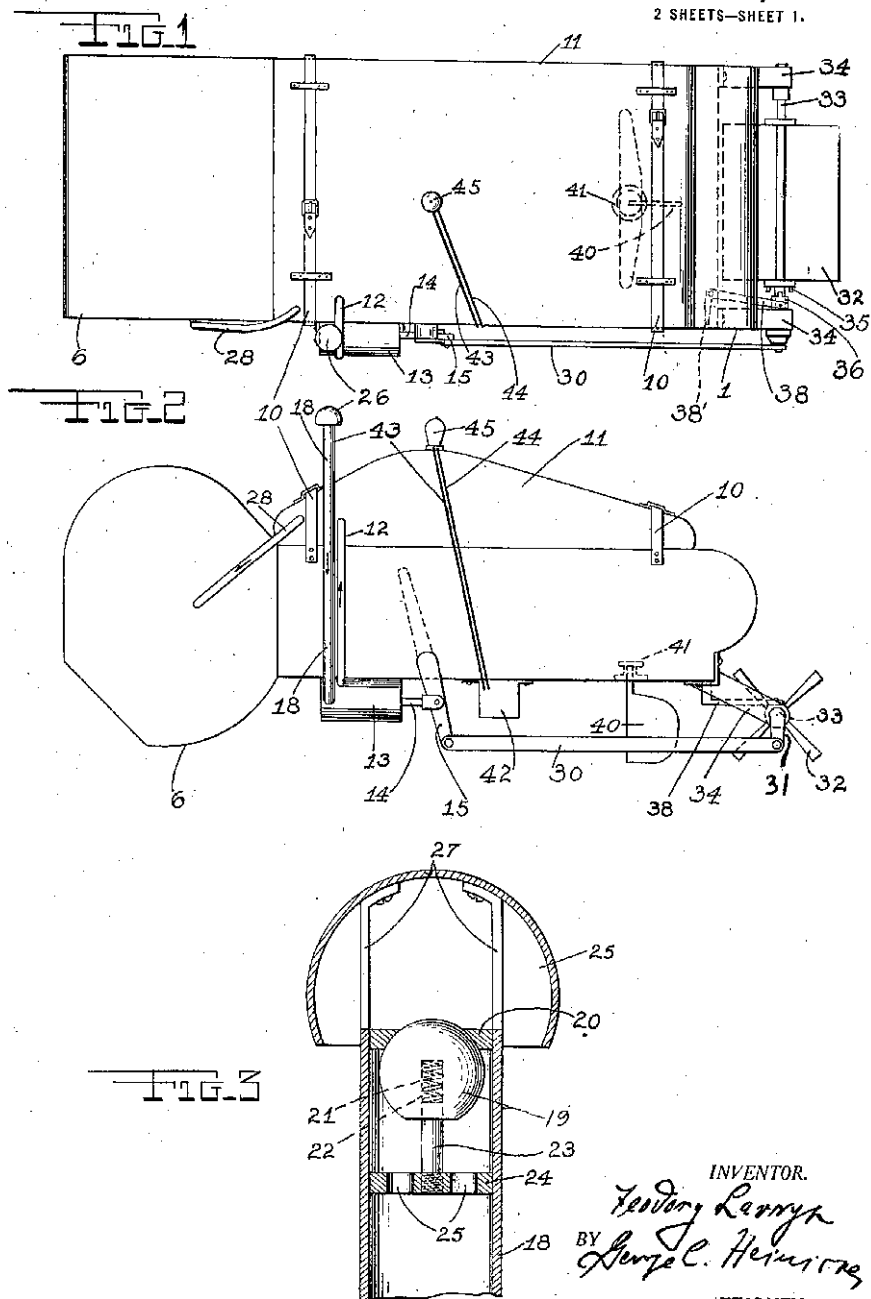


F. LAVRYK.  
LIFE SAVING DEVICE.  
APPLICATION FILED DEC. 11, 1919.

1,341,752.

Patented June 1, 1920.

2 SHEETS—SHEET 1.



INVENTOR.  
*Fredrick Lavryk*  
BY *Samuel C. Hennings*  
ATTORNEY.



F. LAVRYK.  
LIFE SAVING DEVICE.  
APPLICATION FILED DEC. 11, 1919.

1,341,752.

Patented June 1, 1920.

2 SHEETS—SHEET 2.

FIG. 4

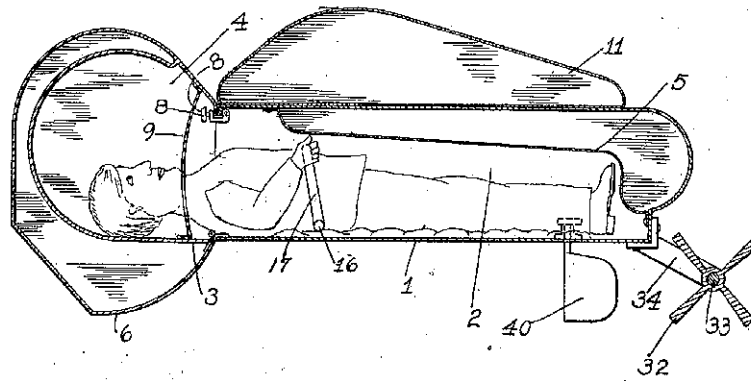
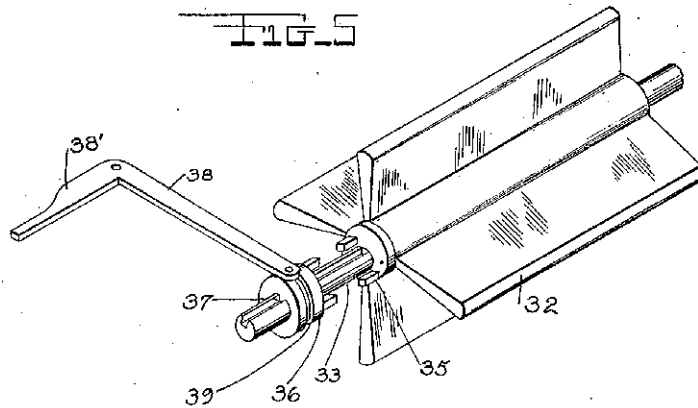


FIG. 5



INVENTOR.

BY *Ferdary Lavryk*  
*Sam C. Harris*  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

FEODOSY LAVRYK, OF CHICAGO, ILLINOIS.

## LIFE-SAVING DEVICE.

1,341,752.

Specification of Letters Patent.

Patented June 1, 1920.

Application filed December 11, 1919. Serial No. 344,080.

*To all whom it may concern:*

Be it known that I, FEODOSY LAVRYK, a citizen of Russia, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Life-Saving Devices, of which the following is a specification.

This invention relates to life preservers for individual use in case of ship wrecks or accidents on the water generally.

The invention has for an object to provide a novel arrangement and combination of parts by which the person using the life preserver will be thoroughly protected from the waves and have an abundant air supply at all times, and in addition to be able to propel and steer himself or herself along the surface of the water and show a night signal which will serve to guide searches.

For further comprehension of the invention and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Figure 1 of the drawings is a plan view of a life preserver constructed according to my invention.

Fig. 2 is a side elevation thereof.

Fig. 3 is an enlarged detail vertical section of the valve controlling the air intake pipe.

Fig. 4 is a longitudinal sectional view of the device.

Fig. 5 is a perspective view of the propeller.

As here shown my improved life preserver comprises an oblong casing 1 inclosing a main compartment 2, a subsidiary casing member 3 inclosing a compartment being secured on one end of the casing. A partition 5 extends in a general diagonal direction across the compartment 2 while the casing 3 has an outer shell 6 spaced therefrom. The casing 3 is hinged as at 7 to the casing 1 on its underside and is secured at its upper side by a hinged clamp 8 operable from the interior. The user assumes a recumbent position on the bottom of the main compartment with his head projecting into the subsidiary compartment, as shown in Fig. 4. A sheet rubber partition 9 extends between the two compartments and is provided with a suitable

opening through which the head projects, the elasticity of the material allowing the opening to be made sufficiently small to have the edges thereof fit snugly against the neck of the user.

Secured upon the top of casing 1 by the straps 10 is an air bag 11 which extends substantially the full length of the casing. Air may be supplied continuously to air bag 11 to keep the latter properly inflated by a pipe 12 leading from an air pump 13 of ordinary reciprocating type having its piston rod 14 connected to a lever arm 15 fulcrumed as at 16 on the side wall of the casing toward the front end, and near the bottom thereof. This lever arm has rigid therewith an operating handle 17 which projects upwardly in the compartment 2. Air enters pump 13 through a pipe 18 which extends upwardly beside the casing, terminating a desired distance thereabove. The upper end of this pipe is provided with a one-way ball valve 19 pushed upwardly against a suitable seat on an apertured head 20 on the top of the pipe by a spring 21. This spring is disposed in a boring 22 in the valve into which the end of a pin 23 projects freely. This pin projecting upwardly from a disk 24 fixed in the pipe 18 and having apertures 25 therein. A hollow cap 26 surrounds the upper end of pipe 18 to prevent accidental striking of waves against the valve 19, this cap being supported on posts 27. From the air bag 11 a pipe 28 leads to the compartment 4.

In addition to the piston rod 14, the lever arm 15 has connected thereto one end of a pitman rod 30 which extends rearwardly and connects at its opposite end to a crank arm 31 adapted to operate a propeller 32 of the paddle type which is loosely mounted on a shaft 33 journaled in brackets 34 at the rear of the casing. The propeller has fixed thereto a clutch member 35 adapted to be engaged by a second clutch member 36 having a feather connection 37 with the shaft 33. This second clutch member may be moved along the shaft 33 to cause the latter to have operative connection with the propeller by means of a lever 38 pivoted in the casing and having an offset 38' adapted to be operated by pressure of the user's foot, this lever engaging a slot 39 in the clutch member 36.

To steer the device a rudder 40 is mounted on the underside of the casing 1 near the

rear end thereof and has secured to the stern thereof, which projects into the casing 1, a cross bar 41 adapted to be engaged by the feet of the user. An electric battery 42 is secured to the under side of the casing 1 and from it wires 43 and 44 lead to an electric light 45 mounted on the top of the air bag 11.

As will be apparent, when the user is in position he can grasp the handles 17 and operate the pump to supply air to the bag 11, and to the compartment 4 for breathing purposes. The propeller 32 may be worked in unison with pump 13 or not as desired by pressing on the short arm of bell crank lever with the foot, while the rudder 40 may also be worked by pressure of the feet on the cross bar 41.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is as follows—

1. A life preserver comprising a main

casing, a subsidiary casing, a rubber sheet apertured to receive the head of the user separating said casings, an air bag on said main casing, and a manually operable pump adapted to supply air to said air bag and subsidiary casing.

2. A life preserver comprising a main casing, a subsidiary casing, a rubber sheet apertured to receive the head of the user separating said casings, an air bag secured on top of said main casing, an electric lamp mounted on top of the said air bag, a battery secured to the main casing supplying electric current to said lamp, a pump carried by the main casing and adapted to supply air to said air bag and subsidiary casing, a propeller mounted on the rear end of the main casing and adapted to be operated in unison with said pump, and steering means carried by said main casing.

In testimony whereof I have affixed my signature.

FEODOSY LAVRYK.

J. SEBETO.  
BATHING BOAT.  
APPLICATION FILED MAR. 19, 1921.

1,388,003.

Patented Aug. 16, 1921.  
2 SHEETS—SHEET 1.

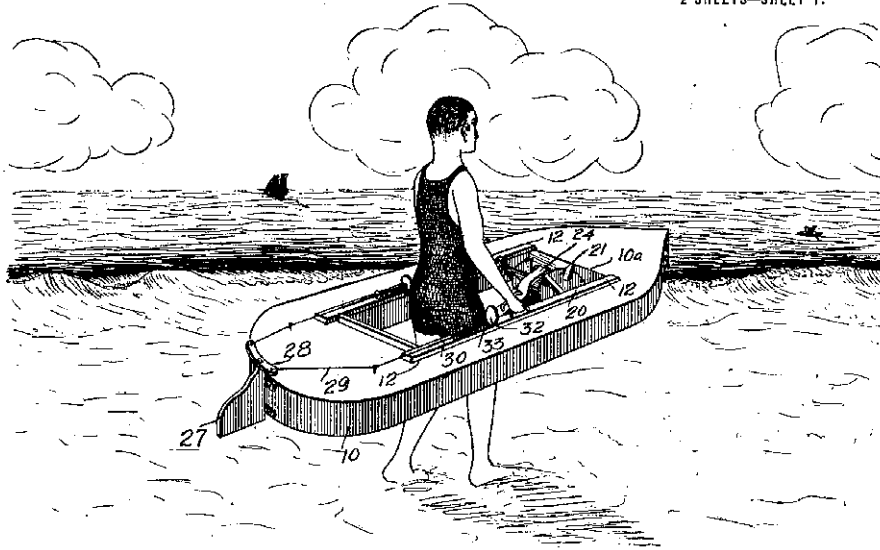
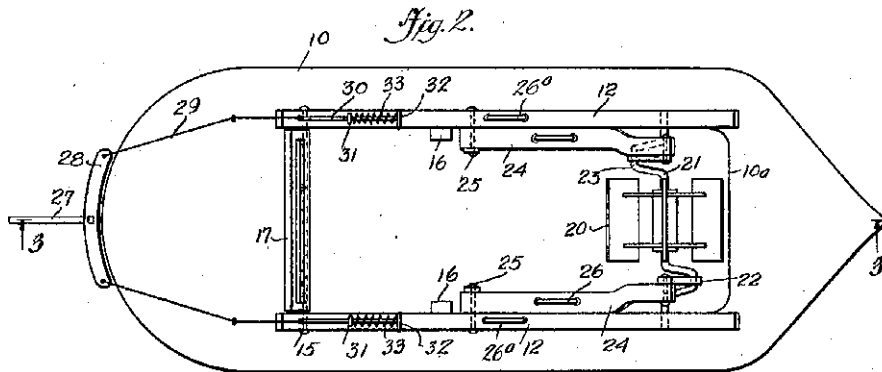


Fig. 1.



WITNESSES  
*Frank J. Faggiani*  
*J. L. McLaughlin*

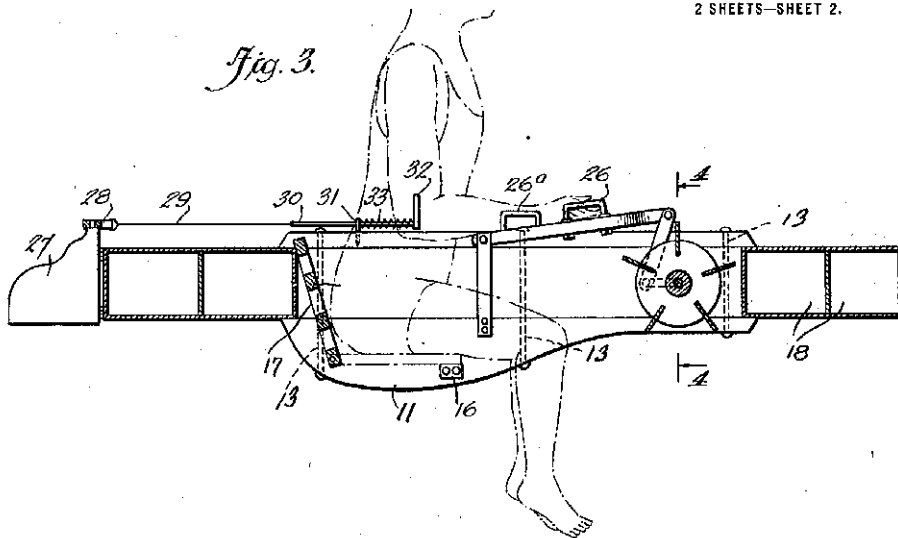
INVENTOR  
JOHN SEBETO  
BY *Mumford*  
ATTORNEYS

J. SEBETO.  
BATHING BOAT.  
APPLICATION FILED MAR. 19, 1921.

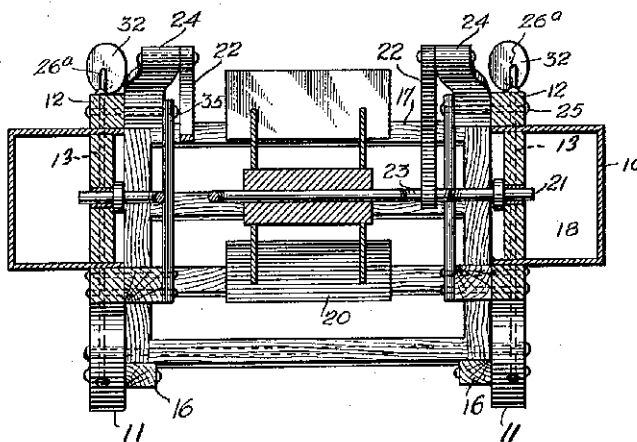
1,388,003.

Patented Aug. 16, 1921.  
2 SHEETS—SHEET 2.

*Fig. 3.*



*Fig. 4.*



WITNESSES  
*Frank J. Higgins*  
*J. L. McAniff*

INVENTOR  
JOHN SEBETO  
BY *Munn & Co*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

JOHN SEBETO, OF BROOKLYN, NEW YORK.

## BATHING-BOAT.

1,388,003.

Specification of Letters Patent. Patented Aug. 16, 1921.

Application filed March 19, 1921. Serial No. 453,598.

*To all whom it may concern:*

Be it known that I, JOHN SEBETO, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Bathing-Boat, of which the following is a description.

The general object of my invention is to provide a novel structure for use by bathers and adapted to afford amusement as well as exercise. The structure in its preferred form includes propelling and steering means and novel actuating and controlling means therefor.

The distinctive features of the invention and its advantages will clearly appear as the description proceeds.

Reference is to be had to the accompanying drawings forming a part of this specification, it being understood that the drawings are merely illustrative of one example of the invention.

Figure 1 is a perspective view of my improved boat showing the manner of carrying the same to or from the water;

Fig. 2 is a plan view of the boat;

Fig. 3 is a longitudinal vertical section thereon on the line 3—3, Fig. 2;

Fig. 4 is an enlarged transverse section on the line 4—4, Fig. 3.

In carrying out my invention in accordance with the illustrated example I provide a hull 10 having an oblong well 10<sup>a</sup> therein extending vertically completely through the hull so that a bather may take a position in the hull in either standing or sitting posture.

Along the bottom of the hull at the sides of the well 10<sup>a</sup> are keel cleats 11 and at the sides of the well on deck are coping cleats 12. In the preferred form of my invention I employ vertical bolts 13 which pass through the cleats 11 and 12, the bolts being desirable to give strength to the structure which in practice is made of very light material.

I provide the structure with a seat so that the bather may assume a sitting posture and rest while in the water, the seat being advantageous also in the propulsion of the boat. In the illustrated example a seat 14 is pivoted at its rear end to the keel cleats 11 by suitable horizontal pivot means indicated at 15. The keel cleats are of an increased vertical dimension at their rear ends

adjacent to the seat and on the opposed side faces thereof are rest members 16 for supporting the seat in the lowered position in the plane of the cleats. The position of the seat is such that the rear wall of the well 10<sup>a</sup> will constitute a back for the seat when the latter is lowered. The seat is adapted to be swung vertically on its pivot against the rear wall of the well for convenience in carrying the boat or leaving it. In use the user steps into the well and lifts the hull as shown in Fig. 1, hand grips being provided as will appear. In this manner the boat may be carried to the water and the seat lowered.

The hull is partitioned to form airtight compartments 18.

In practice I provide a paddle wheel 20 in the well 10<sup>a</sup> near the front, said wheel being mounted on a horizontal shaft 21 having bearings in the hull at the sides. Connecting rods 22 are secured at their lower ends to cranks 23 of the shaft 21 and the upper ends of said rods are pivotally connected with the front ends of hand-operated levers 24 which are pivoted at their rear ends by bolts 25 or the like to the deck cleats 12. Suitable hand-holds 26 are provided on the levers 24 or at other convenient points to be grasped for actuating the paddle wheel and for carrying the structure. Fixed handles 26<sup>a</sup> are shown on cleats 12.

The arrangement is such that the bather particularly when seated may conveniently operate the levers 24 to impart a turning movement to the paddle wheel.

Advantageously, also, the boat is provided with a rudder 27 having a transverse tiller 28 from the ends of which lines 29 run forwardly to connect with slide rods 30 having guided movement in eyes 31 or equivalent means on the cleats 12. The forward ends of the rods preferably have heads 32 and springs 33 are coiled about the rods between the eyes 31 and said heads. The arrangement is such that the user when in the well 10<sup>a</sup> may assume a position for vibrating the levers 24 for actuating the paddle and with the elbows of the user in front of and adjacent to the heads 32 of rods 30 so that pressure by the elbows may be exerted against the rods for controlling the tiller.

I would state in conclusion that while the illustrated example constitutes a practical embodiment of my invention, I do

not limit myself strictly to the exact details herein illustrated since manifestly the same can be considerably varied without departure from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. A structure of the class described, including a hull having a well extending through the bottom in which the user may assume a standing or sitting posture, and a swingable seat on said structure adjacent to the rear end of the well adapted to be swung upwardly against the back wall of the well or to the lowered horizontal position for use, there being supporting means on the hull for the seat when lowered.

2. A structure of the class described, including a hull having a well extending through the same to accommodate the user, a seat mounted on the hull adjacent to the bottom and swingable to a raised position in the hull or a lowered horizontal position for use, and supporting means on said hull for the lowered seat.

3. A structure of the class described, including a hull having a well extending there-through to accommodate the user, coping at the sides of the well, and keel cleats on the hull at the sides of the well.

4. A structure of the class described in-

cluding a hull having a well extending there-through to accommodate the user, and keel cleats on the bottom of the hull adjacent to and outside of the well.

5. A structure of the class described including a hull having a well extending there-through to accommodate the user, keel elements adjacent to the sides of the well, and a seat afforded support on said keel elements.

6. A structure of the class described, including a hull having a well extending there-through to accommodate the user, a paddle wheel in the well at the front, and means adapted to be actuated by one occupying a position in said well to turn said wheel.

7. A structure of the class described, including a hull having a well extending there-through to accommodate the user, a paddle wheel in the well at the front, and means adapted to be actuated by one occupying a position in said well, to turn said wheel.

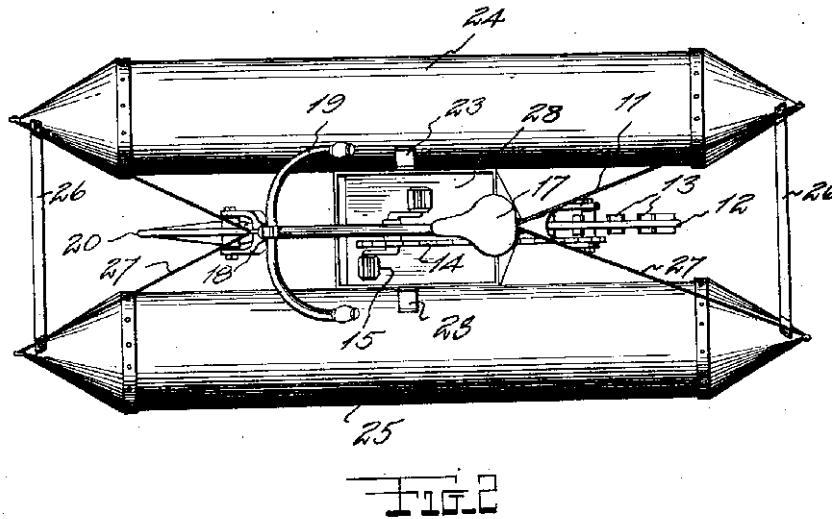
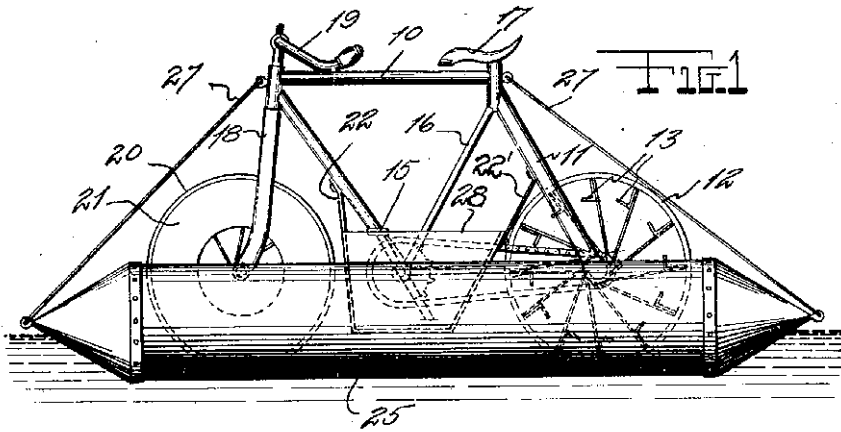
8. A structure of the class described including a hull having a well extending there-through to accommodate the user, a rudder, a tiller on the rudder, and operating means connected with the tiller and including slidable elements extending along the hull at the sides of the well and having means adapted to receive elbow pressure from the user occupying a position in the well.

JOHN SEBETO.

K. OWSIANIECKI.  
WATER BICYCLE.  
APPLICATION FILED MAY 12, 1921.

1,409,965.

Patented Mar. 21, 1922.



INVENTOR  
*Karol Owsianiecki*  
BY *M. R. Riving*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

KAROL OWSIANIECKI, OF BALTIMORE, MARYLAND.

WATER BICYCLE.

1,409,965.

Specification of Letters Patent. Patented Mar. 21, 1922.

Application filed May 12, 1921. Serial No. 469,071.

*To all whom it may concern:*

Be it known that I, KAROL OWSIANIECKI, a citizen of the United States, residing at Baltimore, in the county of Baltimore City and State of Maryland, have invented certain new and useful Improvements in Water Bicycles, of which the following is a specification.

This invention relates to improvements in manually propelled boats and has for its principal object to provide a device designed to exercise the leg muscles of the user and to afford amusement.

Another object of this invention is to provide a means for protecting the feet and ankles of the user from becoming wet.

With these and other objects in view the invention consists in the novel construction, combination and arrangement of parts which will be fully set forth in the following specification, claimed and illustrated in the accompanying drawing, in which,

Figure 1 is a side view of the improved boat, and

Figure 2 is a top plan view of Figure 1.

Referring to the drawings by characters of reference the numeral 10 designates the main frame of the device which is constructed in the ordinary diamond shape commonly used for bicycles. The rear leg 11 of the frame is bifurcated in the approved manner and mounts a wheel 12, to the spokes of which are secured the L shaped paddles 13. The wheel is rotated by the usual sprocket and chain mechanism 14 which is operated by the customary pedals 15 mounted at the lower ends of the saddle post 16. A saddle 17 is adjustably mounted at the upper end of the post 16 as clearly shown in the drawing.

Pivotaly mounted in the forward end of the frame is a fork 18, the upper end of which is provided with handle bars 19 while the lower end mounts a steering wheel 20. A web 21 covers the spokes of the wheel 20

to provide a rudder by means of which the course of the device is controlled.

A box like guard 28, the upper side of which is open is secured to the frame 10 by means of brackets 22-22' and partially incloses the forward sprocket to exclude water therefrom. Secured to opposite sides of the guard 28 are brackets 23 which are riveted or otherwise attached intermediate the ends of cylindrical floats 24 and 25, which are held in spaced parallel relation by bars 26. Guy rods 27 are attached to opposite ends of the frame and to opposite ends of the floats to hold the frame rigid.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be made without departing from the spirit and scope of the invention as claimed.

What is claimed is:

A manually propelled boat comprising a pair of cylindrical floats having uniform conical ends, rods connecting the floats at opposite ends and holding the same in spaced parallel relation, a guard secured between the floats intermediate their ends, a bicycle frame secured to the floats directly over the guard, a webbed wheel mounted between the forks at the forward end of the frame, a wheel between the forks at the rear of the frame, said wheel having tangential spokes, angular paddles carried by the spokes of the last named wheel, said paddles extending outward at both sides of said spokes, the lower portions extending at right angles thereto, and means partially inclosed by the guard to drive the last named wheel.

In witness whereof I affix my signature.

KAROL OWSIANIECKI.

Test:

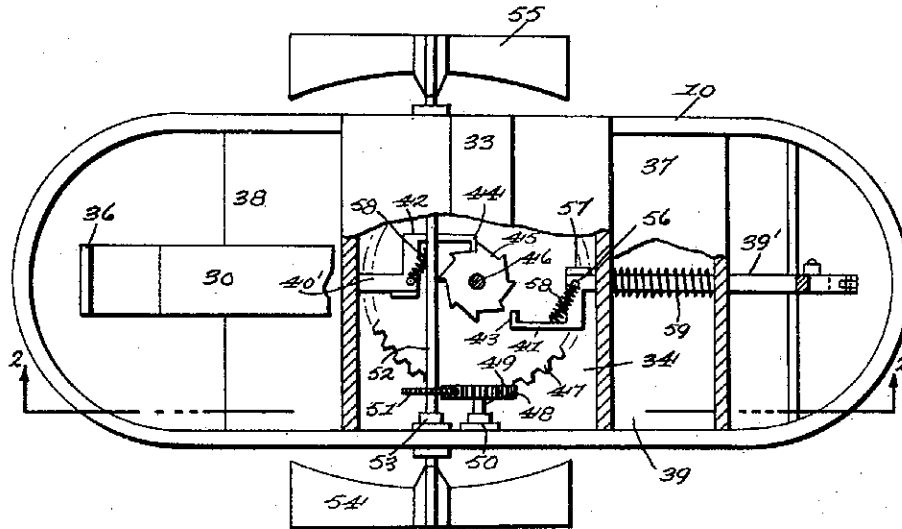
C. M. ZACHARSKI.

S WISNIEWSKI.  
BOAT PROPELLING DEVICE.  
APPLICATION FILED MAY 26, 1921.

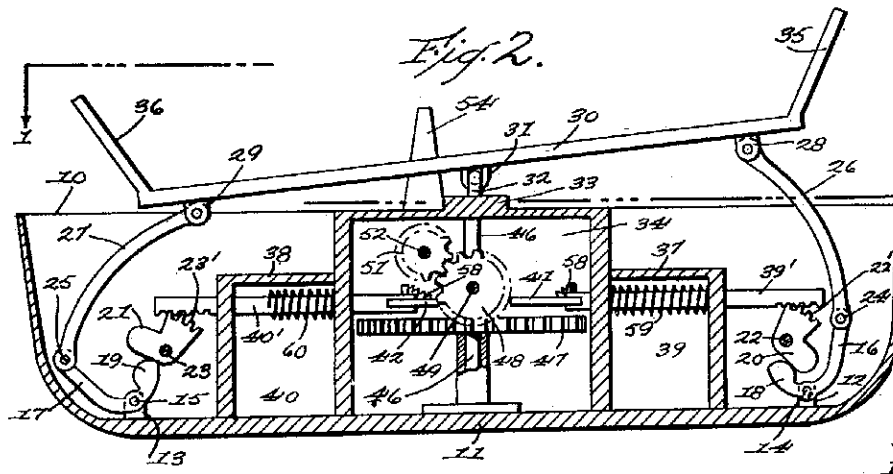
1,410,048.

Patented Mar. 21, 1922.  
2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 2.*



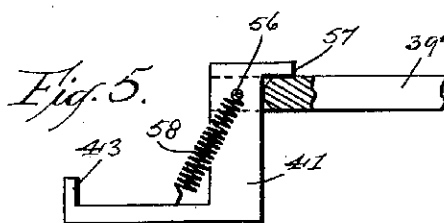
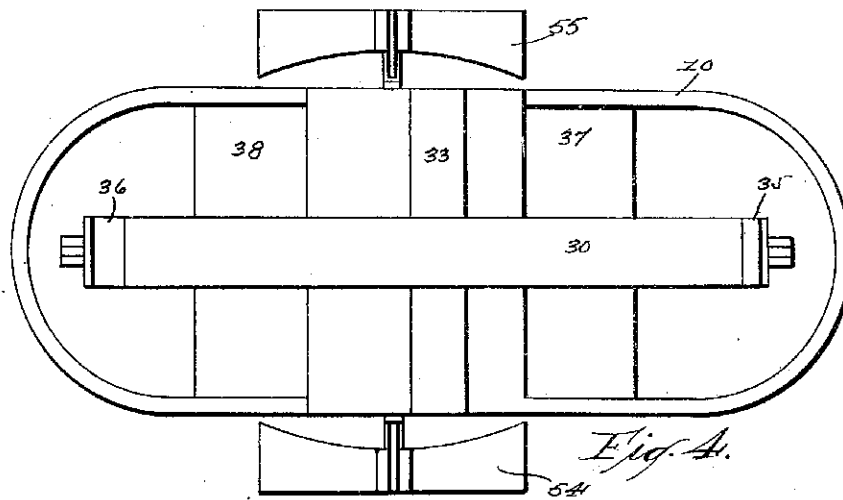
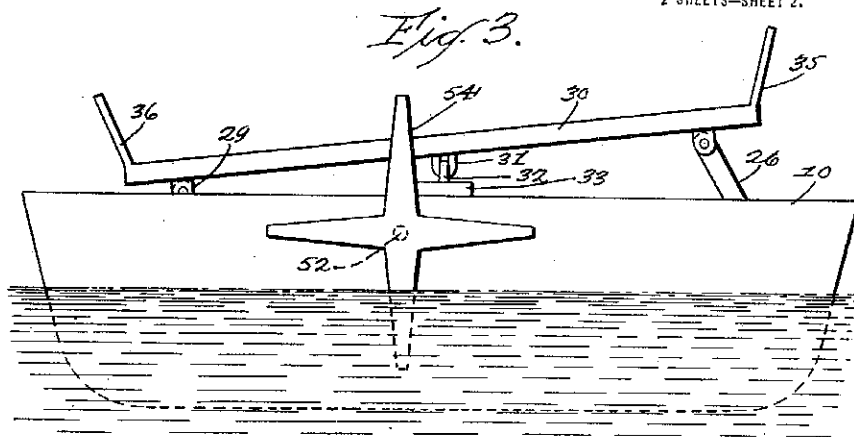
Inventor  
Stanislaw Wisniewski

By *his* Attorney  
George C. Heinicke

S WISNIEWSKI.  
BOAT PROPELLING DEVICE.  
APPLICATION FILED MAY 26, 1921.

1,410,048.

Patented Mar. 21, 1922.  
2 SHEETS—SHEET 2.



Inventor  
Stanislaw Wisniewski  
By *his* Attorney  
George C. Henrich

# UNITED STATES PATENT OFFICE.

STANISLAW WISNIEWSKI, OF HARTFORD, CONNECTICUT.

BOAT-PROPELLING DEVICE.

1,410,048.

Specification of Letters Patent. Patented Mar. 21, 1922.

Application filed May 26, 1921. Serial No. 472,889.

*To all whom it may concern:*

Be it known that I, STANISLAW WISNIEWSKI, a citizen of Poland, residing at Hartford county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Boat-Propelling Devices, of which the following is a specification.

This invention relates to improvement in boat propelling devices, particularly to devices operated by human power for driving two paddle wheels for propelling the boat through the water.

The principal object of the invention is the provision of a device of this character adapted to be actuated by two persons sitting at the ends of a board supported in its middle or center of gravity to operate the board in the manner of a see-saw.

Another object of the invention is to provide a device in which the power developed by the operation of the see-saw is readily transformed and transmitted to the paddle wheels for propelling the boat.

A further object of the invention is to provide a boat propelling device which can be cheaply constructed and installed in any boat, and which is capable of entertaining persons, constituting a means for a healthy outdoor sport.

These and other like objects are attained by the novel construction and combination of parts hereinafter described and shown in the accompanying drawings forming a material part of this disclosure, and in which—  
Figure 1 is a top plan view along line 1—1 of figure 2 of a boat equipped with a propelling device constructed according to the present invention.

Figure 2 is a longitudinal vertical section through a boat, figure 1, the section being taken on line 2—2 of said figure 1.

Figure 3 is a side view of a boat, its paddle wheel and the see-saw board.

Figure 4 is a top plan view upon a boat, its board, seats and paddle wheels, and

Figure 5 is a detail view of one of the angular operating links.

Referring to the drawings, the boat 10 of any ordinary well known construction and material has attached to its bottom 11 at the front and rear ends thereof posts 12 and 13 respectively, to the upper ends of which are pivotally secured between their ends, as at 14 and 15, approximately U-shaped links 16 and 17.

The inner arms of these links carry at their

ends actuating elements 18 and 19 engaging operating members 20 and 21 pivoted intermediate their ends, as at 22 and 23 and having teeth 22' and 23' at their upper faces for a purpose which will hereafter be more fully described.

To the free ends of the outer arms of the links 16 and 17 are pivotally secured, as at 24 and 25, the lower ends of bars 26 and 27, the upper ends of which are pivotally secured to ears 28 and 29 attached to the underside of a board or plank 30 supported in its center of gravity by means of two interengaging links 31 and 32, one of which, 31 being secured to the underside of the plank, while the other is secured to a block 33 on top of a chamber 34 provided in the middle of the boat.

The board 30 is equipped at its ends with back rests 35 and 36 for the persons operating the see-saw and the feet of these persons find a support upon the top covers 37 and 38 of auxiliary chambers 39 and 40 arranged within the boat at both sides of the chamber 34.

Horizontal operating rods 39' and 40' are provided with teeth at the lower faces of their outer ends adapted to be engaged by the teeth 22' and 23' of the operating members 20 and 21 and their opposite inner ends are extended into the central chamber 34 and to these ends are attached angular operating links 41 and 42, provided with fingers 43 and 44 at their outer ends adapted to engage the teeth of a ratchet wheel 45 secured to a vertical shaft 46 on top of a horizontal gear wheel 47 carried by said shaft and in mesh with a smaller vertical gear wheel 48 on a stub shaft 49 journaled in a bearing 50 secured to the inner side wall of the boat. This gear 48 in turn meshes with a small gear 51 on a shaft 52 transversely journaled in bearings 53 attached to the side walls of the boat and extended beyond the same to carry paddle wheels 54 and 55.

The operating links 41 and 42 are constructed as illustrated on an enlarged scale in figure 5, they are pivoted as at 56 to the inner ends of rods 39' and 40' and provided with a shoulder 57 adapted to engage the outer side edges of the rods 39' and 40', while a spring 58 is connecting the pivot points 56 with the arms of the links carrying the operating fingers 43 and 44 respectively.

Springs 59 and 60 are secured with one of their ends to the rods 39' and 40' interme-

diary their ends, while their other ends rest against the outer walls of the chamber 34.

The device operates in the following manner—

5 Upon the operation of the see-saw the rods 39' and 40' will be moved alternately inwardly and outwardly by the intermediary of the bars 26, 27, and links 16 and 17 so that the fingers 43 and 44 of the operating links 10 41 and 42 will alternately engage the backs of the teeth of the ratchet wheel 45 rotating the same and its shaft with the gear wheel 47.

The rotation of this wheel will be transmitted through the gears 48 and 51 to the 15 shaft 52 of the propellers and operate the same to propel the boat which may be steered by any well known means, not shown.

As soon as one of the fingers 43 or 44 has pushed the tooth, it engages, forward, its 20 spring 58 will allow the passage of its lower arm and finger over the side face of the following tooth, so that it will be ready for the next operation to engage another of the teeth.

25 It will be obvious that a device of this character may be made in many sizes and that changes may be made in the general arrangement thereof as well as in the construction of its minor details without departing from the scope and spirit of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is—

35 1. In a device of the class described in combination with a boat and see-saw in said boat, a pair of substantially U-shaped links pivotally secured to posts erected on the bottom of said boat, means for connecting one 40 end of said links to said see-saw, a pair of horizontal operating rods, having rack teeth on their lower end faces, a pair of toothed operating members in engagement with the teeth of said rods and connected to said links,

a central vertical shaft, a ratchet wheel on 45 said vertical shaft adapted to be rotated by said rods, a gear wheel on said vertical shaft rotating with said ratchet wheel, a propeller shaft, a pair of paddles on the outer ends of said shaft and means for transmitting 50 the rotary motion of said gear to said shaft and paddle wheels.

2. In a device of the character described in combination with a boat having a transverse shaft, and side paddle wheels on said 55 shaft for propelling said boat, a see-saw in said boat, a pair of horizontally disposed spring controlled operating rods, means for transmitting the see-saw movement as a reciprocatory motion to said operating rods, 60 a ratchet wheel and gear on a vertical shaft, fingers adapted to be actuated by said reciprocatory horizontal rods for rotating said ratchet wheel and gear, and a train of gears in mesh with said gear wheel for transmitting the rotation of said gear wheel to 65 said transverse paddle wheel shaft.

3. In a device of the class described, a see-saw, a pair of horizontal reciprocatory rods, means for transmitting the see-saw motion 70 to said reciprocatory rods as a to and fro movement, operating links at the inner ends of said rods, a ratchet wheel, fingers at the inner ends of said links for alternately engaging the teeth of said ratchet wheel for 75 rotating the same, springs and shoulders on said fingers for allowing the passage of the same by the teeth of said ratchet wheel after its operation, a pair of paddle wheels, a shaft for said wheels, a gear on said shaft 80 and means for transmitting the rotation of said ratchet wheel to the gear on said shaft for operating the paddle wheels upon the operation of said see-saw.

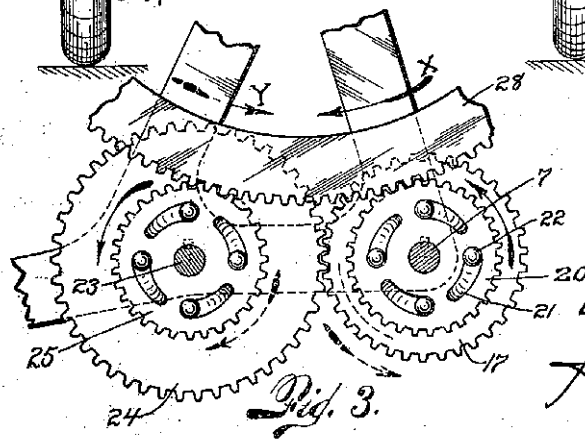
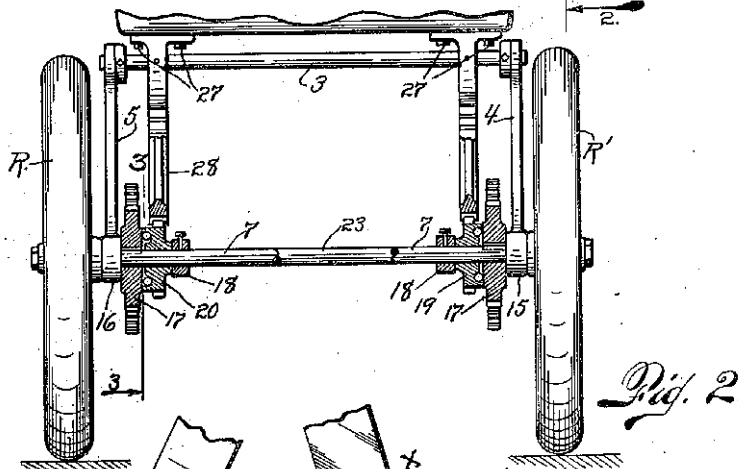
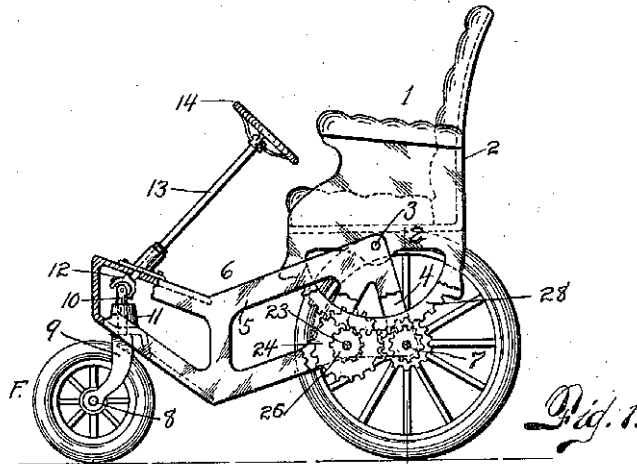
In testimony whereof I have affixed my 85 signature.

STANISLAW WISNIEWSKI.

L. ROSEN.  
MECHANICAL MOVEMENT.  
APPLICATION FILED AUG. 1, 1921.

1,425,902.

Patented Aug. 15, 1922.  
2 SHEETS—SHEET 1.



INVENTOR.  
**Louis Rosen.**  
BY *A. J. Brin*  
ATTORNEY.

L. ROSEN.  
MECHANICAL MOVEMENT.  
APPLICATION FILED AUG. 1, 1921.

1,425,902.

Patented Aug. 15, 1922.  
2 SHEETS—SHEET 2.

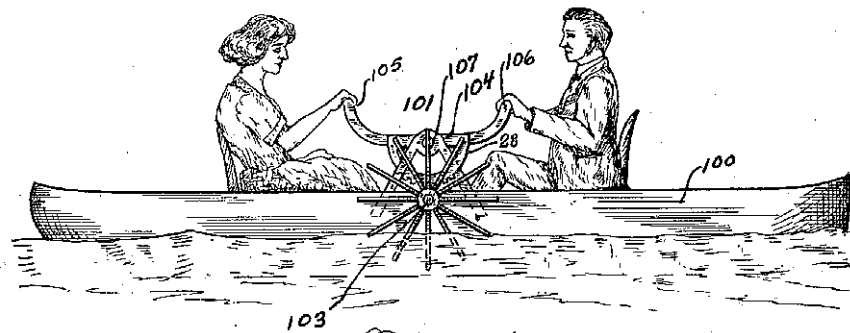


Fig. 4.

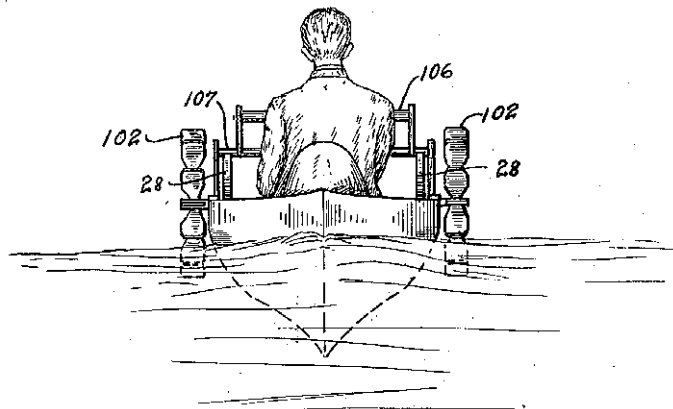


Fig. 5.

Inventor

Louis Rosen

By

*A. J. [Signature]*  
Attorney

# UNITED STATES PATENT OFFICE.

LOUIS ROSEN, OF EDGEWATER, COLORADO.

## MECHANICAL MOVEMENT.

1,425,902.

Specification of Letters Patent. Patented Aug. 15, 1922.

Application filed August 1, 1921. Serial No. 488,859.

*To all whom it may concern:*

Be it known that I, Louis Rosen, a citizen of the United States, residing at Edgewater, county of Jefferson, and State of Colorado, have invented certain new and useful Improvements in Mechanical Movements; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to a mechanical movement of the type by which oscillatory movement can be converted into rotary movement in one direction and has special reference to a rolling chair for invalids in which the chair is propelled by means of power derived from the rocking motion imparted thereto by the back and forth movement of the invalid's body.

It is frequently the case that cripples and invalids who have lost the use of their limbs nevertheless retain a comparatively strong and active body and that they can rock themselves to and fro with considerable force. Although chairs of various kinds are made for the use of invalids and cripples, some operated by the hands alone and others by the feet alone, yet as far as I am aware there are no chairs made that can be operated by the rocking of the body alone.

It is the object of my invention to provide a rolling chair that can be operated by cripples or invalids who have lost the use of their limbs and by means of which they may be able to move from place to place by power derived from the movement of their bodies.

My invention can be best understood by reference to the accompanying drawings in which—

Fig. 1 is a side elevation of my rolling chair with parts broken away.

Fig. 2 is an end elevation partly broken away and part in section taken on line 2—2

Fig. 3 is a detail view taken on line 3—3, Fig. 2.

Fig. 4 is a side elevation of a boat equipped with my propelling device suitably modified, and

Fig. 5 is an end elevation of the boat shown in Fig. 4.

The same reference numerals will be used to indicate the same parts throughout the several figures.

In Fig. 1, which illustrates the preferred embodiment of my invention, 1 represents my improved rolling chair in its entirety, the chair member 2 which is provided with the usual seat, back and arm rest, is pivotally mounted at 3 between the two sides 4 and 5 of the main supporting frame, which is indicated as a whole by the numeral 6. The supporting frame 6 is mounted on three wheels F, R and R' of which F is the front or steering wheel and R and R' are the rear wheels, one of which is keyed to the axle 7 and serves as the driver. The front wheel F is mounted on a spindle 8 by which means it is secured to the ends of the forked member 9 which has a shank 10 extending through an inwardly projecting bearing 11 secured to frame 6. Secured to the top of shank 10 is a universal joint 12 to which a steering post 13 bearing a steering wheel 14 is connected. The lower portions of frames 4 and 5 are provided with bearings 15 and 16 in which is rotatably mounted the axle 7, ball or roller bearings being employed in the usual way.

Keyed to the axle 7 on the inner side of bearings 15 and 16 are gear wheels 17. Rotatably mounted on the axle 7 and held in place thereon by means of collars 18 are two gear wheels 19 and 20. A ratchet mechanism is provided between gear wheels 17 and gear wheels 19 and 20 in order that the gears 19 and 20 when turned in a direction that would cause the chair to move backward, will be freely rotatable and when rotated in the opposite direction will engage with the gears 17 and rotate them. Any suitable ratchet mechanism may be used but, as an example, I have shown one side of wheels 19 and 20 provided with arcuate grooves having one end of considerable depth and a ball 22 in each of said grooves, the incline of the grooves being such that when the wheel is to act as a driver the deepened end of the groove will travel ahead and thus permit the balls to roll up on the shallow portion and become wedged against the surface of gears 17. Mounted in suitable bearings in the lower portion of frame 6 is a second shaft 23 which has non rotatably se-



cured thereto, near the ends thereof, gear wheels 24 which mesh with gear wheels 17 but are somewhat larger in diameter. Rotatably secured to shaft 23 and held in place against the sides of wheels 24 by means of collars 18, or other suitable means, are gear wheels 25 and 26, which are identical with gear wheels 19 and 20. A ratchet mechanism similar to the one employed between wheels 19, 20 and wheels 17 is provided between wheels 25, 26 and wheels 24. Secured to the bottom of the chair portion 1 by means of bolts 27 are two gear sectors 28 which are pivoted on shaft 3 and have their gear teeth engaging with gears 19 and 25 and 20 and 26 respectively in the manner indicated in Fig. 3. Shafts 3, 7 and 23 form the vertices of an isosceles triangle and as sectors 28 are pivotally mounted on shaft 3, their geared peripheries are always in mesh with gears 19 and 25 and 20 and 26 as pointed out above.

One of the rear wheels only is keyed to shaft 7 while the other is freely rotatable thereon, the reason for this being that in turning a corner one traverses a greater distance than the other and that, therefore, relative rotation between the wheels is necessary.

The operation of my device is as follows:

Let us suppose that a person is sitting in the chair 1 with his hands grasping the wheel 14 and his feet resting on the upper surface of frame 6 and let the person so seated move his body backwardly, he will thereby move the chair backwardly about the pivot 3 and the gear sector 28 will move forwardly in the direction of arrow X (Fig. 3). Gear wheels 19 and 25 will at the same time be rotated in the direction indicated by the arrows shown in full. When gear wheel 19 is rotated in the direction indicated by the arrow shown in full, balls 22 will be moved to the shallow portion of groove 21 and become wedged between the bottom of the grooves and the side of wheel 17, locking the two wheels together and causing them to rotate as one. Gear wheel 17 will, of course, cause gear wheel 24 to rotate in the direction indicated by the broken arrow (Fig. 3). As gear sector 28 is in engagement with the teeth of gear 25, the latter will rotate in the same direction as gear 19. The clutches between the two set of gear wheels are so related that when the one between gears 19 and 17 is operative the one between wheels 24 and 25 will be inoperative and vice versa. When the chair has reached the limit of its backward rotation the operator will incline his body forwardly and sectors 28 will move rearwardly in the direction indicated by arrow Y. The clutch between wheels 24 and 25 will now become operative and the clutch between wheels 17 and 19 inoperative whereby shaft 7 will be

rotated, through the medium of gears 25, 24 and 17, in the same direction as before. From the above it will be noticed that the chair will be moved in the same direction regardless of the direction in which the chair moves about the pivot 3.

I have shown gear 24 somewhat larger in diameter than gear 17 while gears 19 and 25 are of equal diameter, the reason for this is that we have the greatest propelling power exerted when the chair is rocked backwardly in starting and as the chair is gotten under way, the forward rocking of the chair acts through the greater gear ratio with less force but with greater speed.

I have shown my chair as equipped with two gear sectors 28 and a duplicate set of driving gears but it is evident that my chair will operate with one gear sector and one set of gears and I do not intend that the disclosure, which shows the driving gears in duplicate, shall be understood as a limitation in this respect but merely as illustrative.

My device is especially well adapted to be applied to boats and canoes for propelling the same and in Figs. 4 and 5 I have shown a boat equipped with a propelling device embodying the principle of my present invention, but modified slightly to adapt it to this use. Boat 100 has attached near the center thereof a propelling device which is indicated as a whole by the numeral 101; this device is substantially the same as the one used in connection with my chair. The wheels of the chair have been replaced by paddle wheels 102 which are both keyed to the shaft 103 instead of one only, as in the case of the chair. In place of the chair I have substituted a frame 104, each end of which is provided with a bar 106 to be grasped by the hand of the operator in the manner shown. Frame 104 is pivotally mounted on shaft 107 and has connected to each side thereof two segmental gear members 28, whose teeth cooperate with a set of gears in the manner shown in Figs. 1, 2 and 3 in which figures shaft 7 corresponds to shaft 103 in Fig. 4. The power transforming and transmitting gearing has not been shown in detail in Figs. 4 and 5 but it is to be understood that the same arrangement is to be employed here as is described in connection with the chair.

The uses specifically enumerated are by no means the only ones to which my device is adapted. It can be embodied in self propelled vehicles for children, in toys of various kinds and can be used to convert oscillatory movement into rotary movement in one direction wherever it is found desirable to do so.

I desire to point out that when my mechanism is embodied in a rolling chair the chair

can be used in the same manner as any ordinary rolling chair, for the reason that when the chair is pushed ahead the ratchets will not operate and hence the chair portion will remain stationary.

Having described my invention what I claim as my invention is:

1. A rolling chair comprising a supporting frame (6), a guide wheel (F) pivotally attached to said frame (6) means (12, 13, 14) for controlling said guide wheel, a pair of supporting wheels (R, R') rotatably attached to said frame, a chair (1) supported on pivots (3) spaced from but parallel with the pivots (7) upon which said supporting wheels rotate and adapted to be oscillated back and forth about its pivot, and means comprising a gear sector (28) attached to said chair and engaging with two gear wheels (19, 25) rotatably connected to two parallel spaced pivots (7, 23), cooperating gear wheels (17, 24) mounted on said last named pivots, and ratchet means between the gears on each pivot, whereby the oscillatory movement of said chair will be changed to a rotary movement in one direction and transmitted to one of said supporting wheels for the purpose of propelling said rolling chair in a forward direction.

2. A rolling chair comprising a supporting frame (6) a guide wheel (F) pivotally connected thereto, means (12, 13, 14) for controlling said guide wheel, an axle (7)

pivotally connected to said frame, a pair of supporting wheels (R, R') mounted on said axle one of said wheels being rotatably secured to said axle and the other non-rotatably attached thereto, a second axle (23) mounted in said frame and parallel with said first named axle, a gear (17) non-rotatably mounted on said axle (7) a second gear (19) also mounted on said axle in juxtaposition to said first named gear (17), ratchet means between said gears, a gear (24) mounted on said second axle and engaging with the first named gear (17), a second gear (25) mounted on said second named axle (23), ratchet means between the two gears (24, 25) on said second named axle, a third axle (8) mounted in said frame and spaced equidistantly from each of the two first named axles, a gear sector (28) pivotally mounted on said last named axle and engaging with one gear on each of the first named axles, and a chair secured to said gear sector, and adapted to oscillate the latter about its pivot on said third axle, said gears and ratchets having such relation one to the other that the oscillatory motion of said gear sector about its pivot will be transformed into rotary motion in one direction and transmitted to said first named axle.

In testimony whereof I affix my signature.

LOUIS ROSEN.



A. NUÑEZ.

BOAT.

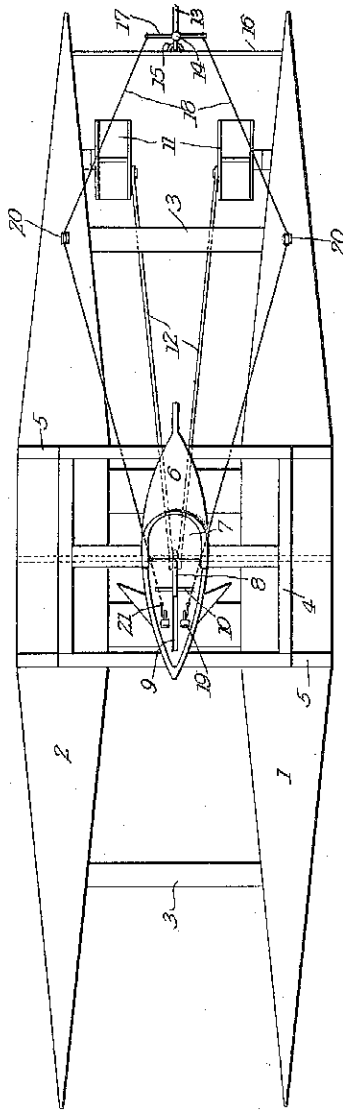
APPLICATION FILED MAR. 31, 1922.

1,432,611.

Patented Oct. 17, 1922.

2 SHEETS—SHEET 1.

FIG. 1.



*E. B. Middleton*  
WITNESS.

Angel Nuñez

INVENTOR

BY *Victor J. Evans*

ATTORNEY

1,432,611.

Patented Oct. 17, 1922.  
2 SHEETS--SHEET 2.

Fig. 2.

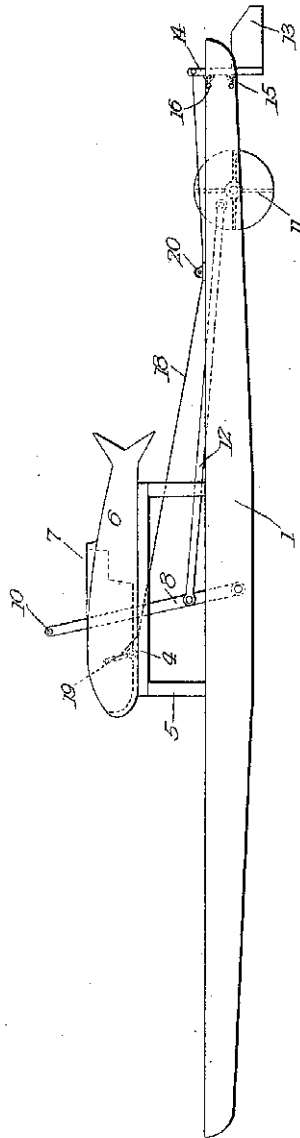
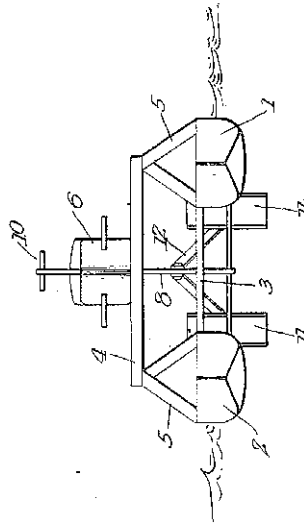


Fig. 3.



*G. H. Baker*  
L. O. Middleton.

WITNESS:

Angel Nuñez,  
INVENTOR  
BY *Victor J. Evans*  
ATTORNEY

Patented Oct. 17, 1922.

1,432,611

# UNITED STATES PATENT OFFICE.

ANGEL NUÑEZ, OF NEW YORK, N. Y.

BOAT.

Application filed March 31, 1922. Serial No. 548,410.

*To all whom it may concern:*

Be it known that I, ANGEL NUÑEZ, a subject of Spain, residing at New York, in the county of New York and State of New York, have invented new and useful improvements in Boats, of which the following is a specification.

This invention relates to improvements in boats, the general object of the invention being to provide a pair of non-sinkable members or floats, supporting a frame for the operator.

Another object of the invention is to provide manually operated means for propelling the boat and steering the same.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a plan view of the invention.

Figure 2 is a side view.

The remaining figures are detail views.

In these views 1 and 2 indicate a pair of hermetically closed floats which are preferably of the shape shown and which are connected together by the cross pieces 3. A frame 4 is provided with the legs 5 and these legs are secured to the plates so that the frame is supported centrally of the floats. This frame supports a body 6 which is of substantially fish-shape and has a seat 7 at its center for the operator of the boat. A lever 8, pivotally secured at its lower end to a part of the frame, passes through a slot 9 in the body and has its handle 10 arranged where it can be grasped by the operator who occupies seat 7. This lever is connected with the paddle wheels 11 by the rods 12, these parts being so arranged that the oscillation of the lever will cause a rotary movement of the paddle

wheels and thus the boat will be caused to move through the water. A rudder 13 is pivotally mounted at the rear of the boat by having its stem 14 passing through eyes 15 in the cross rods 16 which are connected with the rear ends of the floats. A cross piece 17 is connected with the upper end of the stem 14 and cables 18 have their ends connected with said cross piece and with the pedals 19 which are arranged in the body in a position where they can be actuated by the feet of the operator. The cables pass over guiding pulleys 20 and through holes 21 in the bottom of the body. By pressing one pedal the rudder will move the boat in one direction and by pressing the other pedal the boat will be moved in an opposite direction.

It will thus be seen that the boat can be propelled and steered by a person sitting in the seat 7 and due to the shape of the floats the boat can be propelled through the water with but little effort. If desired other seats may be placed on the frame 4 so that the boat can be made to carry passengers.

It is thought from the foregoing description that the advantages and novel features of my invention will be readily apparent.

I desire it to be understood that I may make changes in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What I claim is:—

A boat of the class described comprising a pair of hermetically sealed floats having tapered ends, cross pieces connecting the floats together, an elevated frame supported centrally by the floats, a body located on the frame, a seat in the body, a lever pivotally supported at its lower end and passing through a slot in the bottom of the body, a pair of paddle wheels, rods connecting the lever with said wheels, a rudder, a pair of pedals in the body and cables connecting the pedals with the rudder.

In testimony whereof I affix my signature.

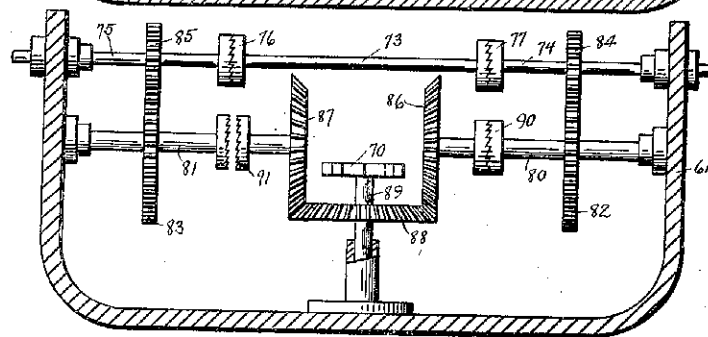
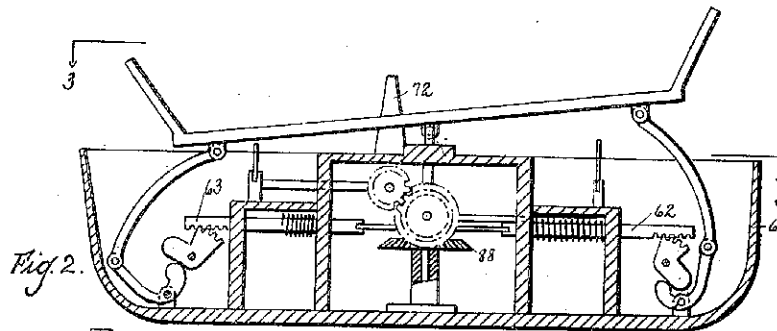
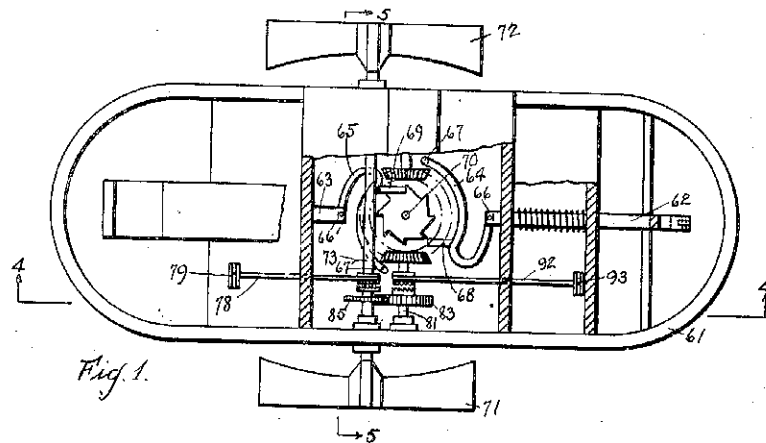
ANGEL NUÑEZ.



S. WISNIEWSKI.  
BOAT PROPELLING DEVICE.  
APPLICATION FILED MAY 12, 1922.

1,434,868.

Patented Nov. 7, 1922.



INVENTOR.  
Stanislaw Wisniewski  
BY  
George C. Heinicke,  
ATTORNEY.



## UNITED STATES PATENT OFFICE.

STANISLAW WISNIEWSKI, OF SOUTH MANCHESTER, CONNECTICUT.

## BOAT-PROPELLING DEVICE.

Application filed May 12, 1922. Serial No. 560,331.

*To all whom it may concern:*

Be it known that I, STANISLAW WISNIEWSKI, a citizen of Poland, residing at South Manchester, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Boat-Propelling Devices, of which the following is a specification.

This invention relates to improvements in boat propelling devices, particularly to devices operated by human power for driving two paddle wheels for propelling the boat through the water, as for instance described in my Patent No. 1,410,048 of March 21, 1922.

The principal object of the invention is the provision of a device of this character adapted to be actuated by two persons sitting at the ends of a board supported in its middle or center of gravity to operate the board in the manner of a see-saw.

Another object of the invention is to provide a device in which the power developed by the operation of the see-saw is readily transformed and transmitted to the paddle wheels for propelling the boat.

A further object of the invention is to provide a boat propelling device which can be cheaply constructed and installed in any boat, and which is capable of entertaining persons, constituting a means for a healthy outdoor sport.

These and other like objects are attained by the novel construction and combination of parts hereinafter described and shown in the accompanying drawings forming a material part of this disclosure, and in which—

Figure 1 is a top plan view along line 3—3 of Figure 2 showing a boat equipped with the preferred form of propelling device.

Figure 2 is a longitudinal vertical section on line 4—4 of Figure 1, and

Figure 3 is a cross-section on line 5—5 of Figure 1.

As illustrated in the drawings the boat is constructed in general in the same manner as described in my Patent No. 1,410,048, with the exception of the following differences:

To the inner ends of the horizontal operating rods 62 and 63, operating spring links 64 and 65 of a peculiar shape as best illustrated in Figure 1 are secured which are pivoted at one end as indicated at 66 and 66' to the ends of links 62 and 63 and at the other, as indicated at 67 and 67' to the boat, and which carry operating fingers 68 and 69 respectively for operating the horizon-

tal ratchet wheel 70 in the same manner as the fingers 43 and 44 operate wheel 45.

In order to allow a turning of the boat by the operation of the paddle wheels 71 and 72, the shaft 73 carrying these paddle wheels is divided, and its parts 74 and 75 can be connected with the central part 73 by means of clutches 76 and 77 adapted to be operated by means of operating rods 78 and handles 79.

Thus, if it is desired to make a turn to the left, the left hand wheel is disengaged while the right hand wheel is operated. In order to permit a change in the direction of travel, the shafts 80, 81 carrying the gears 82, 83 which are in engagement with gears 84, 85 on the wheel shafts and carry at their inner ends the bevel gears 86, 87 adapted to be operated by the bevel wheel 88 operated from shaft 89 of ratchet wheel 70, are divided and provided with clutches 90 and 91 adapted to be operated by rods 92 with handles 93.

It will be obvious that a device of this character may be made in many sizes and that changes may be made in the general arrangement thereof as well as in the construction of its minor details without departing from the scope and spirit of the invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is—

1. In a boat propelling device of the character described, a pair of propellers, a driving mechanism, comprising a pair of vertical bevel gears, a horizontal bevel gear in mesh with said vertical bevel gear, means for coupling said horizontal bevel gear with said driving mechanism, a divided shaft for said propellers, a divided shaft for each of said vertical bevel gears, gears on the parts of said propeller shaft, and gears on the parts of said bevel gears in mesh with said gears in the propeller shaft, couplings for coupling the parts of said shafts and operating means for said couplings.

2. In a boat propelling device of the character described, a see-saw, a pair of spring controlled horizontal rods, operating connections between said rods and said see-saw for transforming the see-saw movement into a reciprocatory longitudinal motion, a pair of spring links having a shorter and a longer arm secured with the ends of their shorter arms to the inner ends of said links, and se-

cured with the outer ends of the longer arms to said boat, operating fingers on said links, a ratchet wheel, a vertical shaft for said ratchet wheel, said ratchet wheel adapted to be operated by said fingers, a horizontal 5 bevel gear on said vertical shaft, a pair of vertical bevel gears in mesh with said horizontal bevel gear, a divided propeller shaft, clutches for coupling the parts of said shaft, 10 means for operating said clutches, gears on the parts of said propeller shaft divided shafts for said vertical bevel gears, clutches for coupling the parts of said shaft, means for operating said clutches, and gears on said shafts in mesh with said gears of said 15 propeller shaft, for allowing a steering of the boat by the operation of said clutches and for reversing the direction of propulsion.

In testimony whereof I have affixed my 20 signature.

STANISLAW WISNIEWSKI.



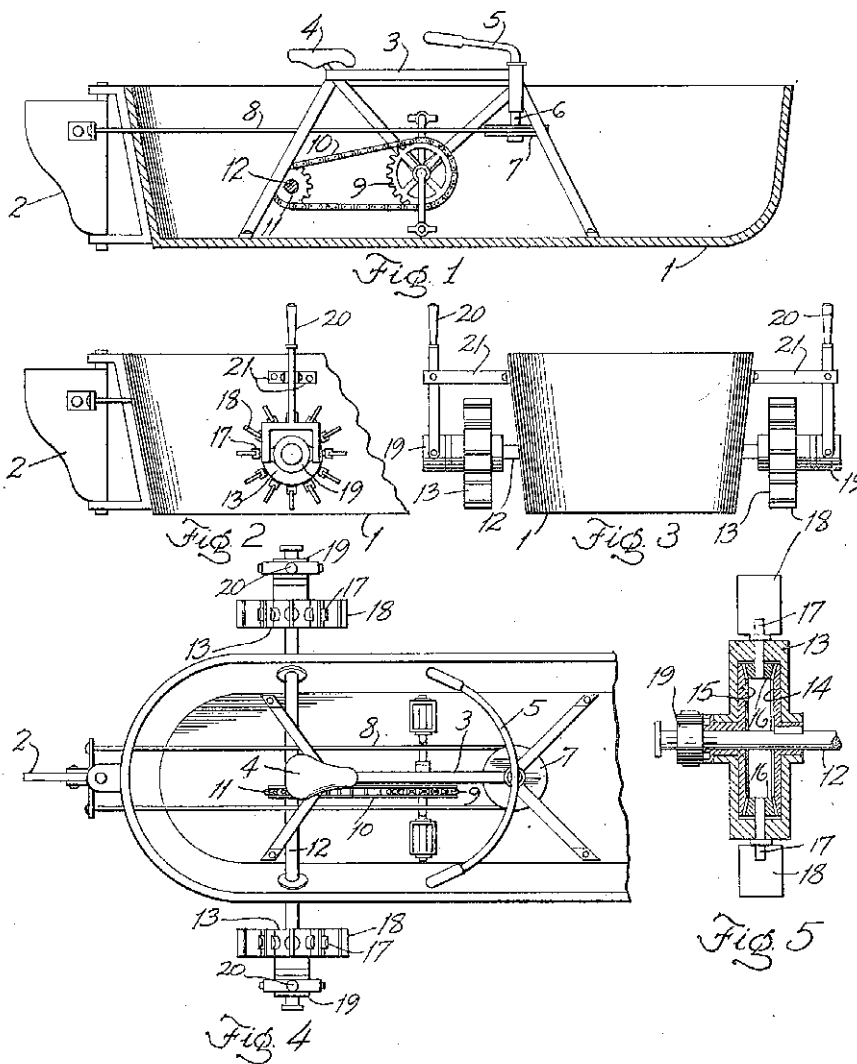
June 19, 1923.

1,459,297

G. SWAN

BICYCLE BOAT

Filed Sept. 28, 1921



WITNESS:  
O. L. Osgood

BY

INVENTOR.  
G. Swan  
H. J. Sanders  
ATTORNEY.

## UNITED STATES PATENT OFFICE.

GUSTAVE SWAN, OF SIOUX FALLS, SOUTH DAKOTA.

## BICYCLE BOAT.

Application filed September 28, 1921. Serial No. 503,768.

*To all whom it may concern:*

Be it known that I, GUSTAVE SWAN, a citizen of Norway, residing at Sioux Falls, in the county of Minnehaha and State of South Dakota, have invented certain new and useful Improvements in Bicycle Boats, of which the following is a specification.

This invention relates to improvements in bicycle boats. One object is to provide a boat of this type in which the driving and steering parts are so arranged that it is possible to readily drive the boat forward or backward or to cause it to turn as upon a pivot in order to effect a perfect landing without particular effort on the part of the operator. A further object is to provide a novel boat of this type that is cheap to manufacture and simple and efficient in operation.

With the foregoing and other objects in view the invention consists in the combination and arrangement of parts to be hereinafter fully described, pointed out in the appended claims and illustrated in the accompanying drawing which forms a part of this application and in which—

Fig. 1 is a longitudinal sectional view through the hull of the boat.

Fig. 2 is a fragmentary view of the boat in side elevation.

Fig. 3 is a fragmentary front end view.

Fig. 4 is a fragmentary plan view.

Fig. 5 is an enlarged fragmentary sectional view illustrating the construction of one of the paddle wheels.

Like reference characters denote corresponding parts throughout the several views.

The reference numeral 1 denotes the hull of the boat and 2 the rudder. Within the hull of the boat is the bicycle frame 3 having the seat 4 and handle bars 5, the stem 6 of which is provided with the sheave 7 that is connected by the steering cable 8 with the rudder 2. The sprocket wheel 9 is connected by sprocket chain 10 to the pinion 11 fast upon the transverse drive shaft 12 that extends through the sides of the hull and is provided at its ends with the paddle wheels 13.

Each paddle wheel 13 comprises a casing within which are two faced bevel gears 14, 15 which are connected by a plurality of bevel pinions 16 the shafts 17 of which extend through the paddle wheel casing and are

provided with the paddles 18. The bevel gears 14 are keyed to the shaft 12 but the bevel gears 15 are loose thereupon but adapted for releasable engagement with the sliding clutches 19 slidable upon said shaft and controlled by the hand levers 20 fastened to supporting arms 21 carried by the hull.

When it is desired to propel the boat forward the operator pedals the bicycle and so rotates the shaft 12 in one direction. If the clutches 19 are engaged with the bevel gears 15 the paddle wheel casing will be caused to rotate and the paddles 18 to impel the boat forward. Pedaling in the opposite direction will reverse the shaft 12 and paddle wheels. To cause the boat to pivot the operator throws out one of the clutches which will cause the shaft 12 through one of the bevel gears 14 and bevel pinions 16 to rotate the paddles 18 while the paddle wheel casing does not rotate. The operator from his seat is in easy reach of the handle bars 5 and also of the levers 20.

What is claimed is:—

1. In a bicycle boat, a transverse shaft extending through the sides of the boat hull, paddle wheels, and means for releasably securing said paddle wheels to said transverse shaft, the paddles of said paddle wheels being adapted for rotation independently thereof when said paddle wheels and transverse shaft are disconnected and said transverse shaft is rotating.

2. In a bicycle boat, a transverse shaft extending through the sides of the boat hull, paddle wheel casings loose upon said transverse shaft, faced bevel gears within said paddle wheel casings, one of each pair of faced bevel gears being keyed to said transverse shaft, bevel pinions connecting said faced bevel gears, shafts for said bevel gears extending through said paddle wheel casings, paddles carried by said bevel gear shafts, and clutches for releasably securing the non-keyed bevel gears to said transverse shaft.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two subscribing witnesses.

GUSTAVE SWAN.

Witnesses:

D. S. JOHNSON,  
L. N. HOSTETER.

Nov. 11, 1924

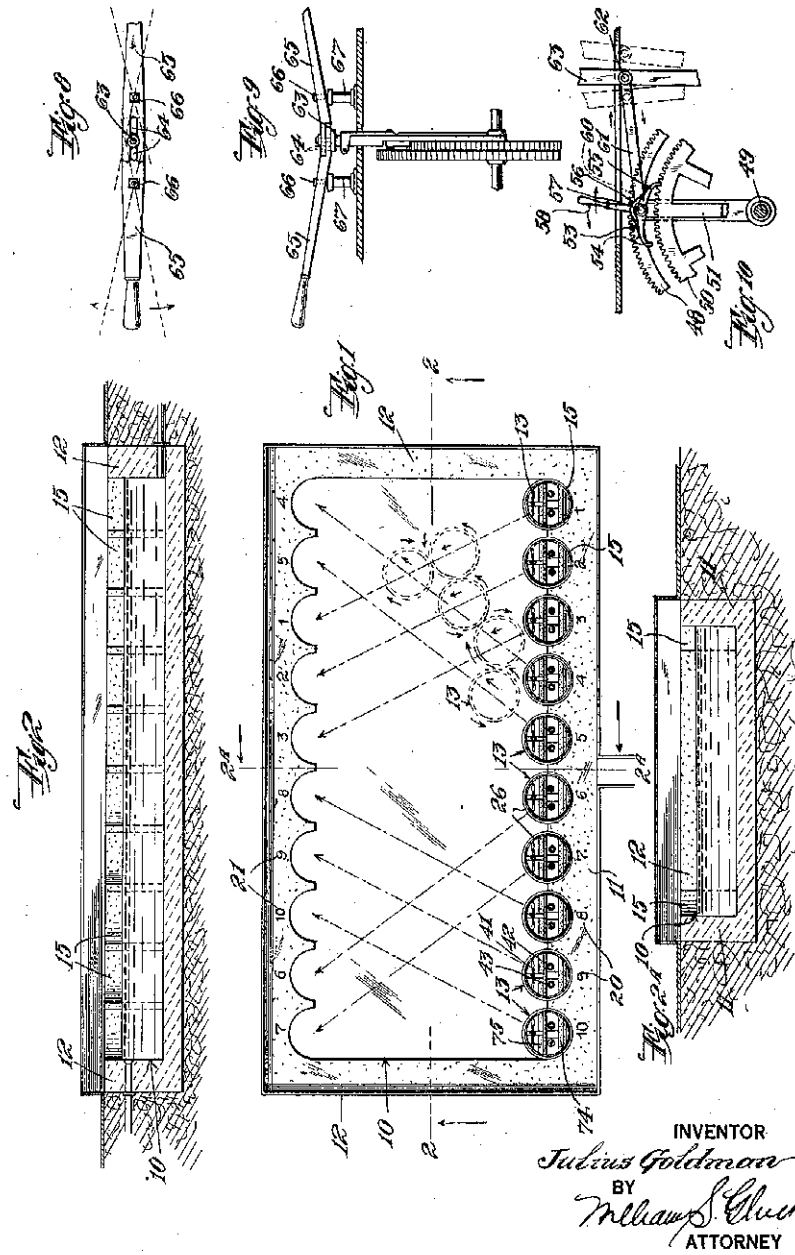
1,514,961

J. GOLDMAN

AMUSEMENT APPARATUS

Filed Aug. 20 1923

2 Sheets-Sheet 1



INVENTOR  
*Julius Goldman*  
BY  
*William S. Clark*  
ATTORNEY

Nov. 11, 1924

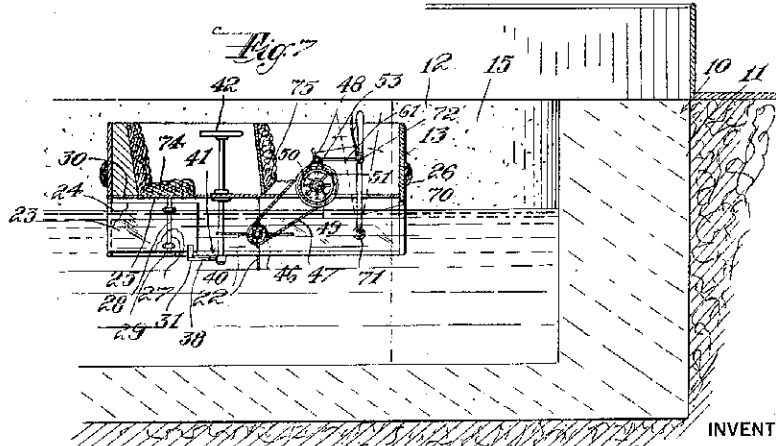
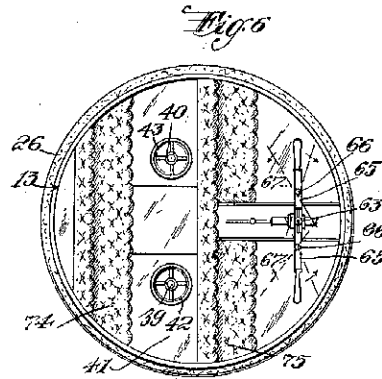
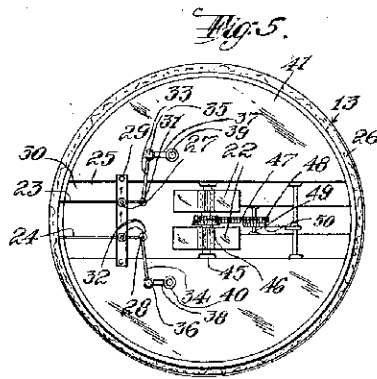
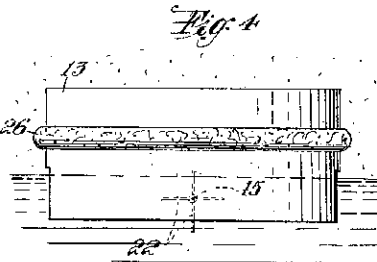
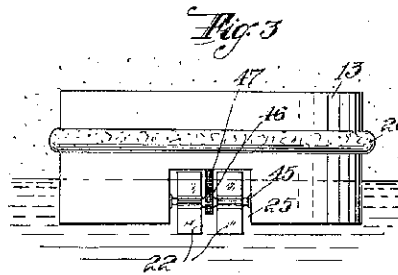
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J. GOLDMAN

AMUSEMENT APPARATUS

Filed Aug. 20 1921

2 Sheets-Sheet 2



INVENTOR

*Julius Goldman*  
BY  
*William S. Sheet*  
ATTORNEY

Patented Nov. 11, 1924.

1,514,961

# UNITED STATES PATENT OFFICE.

JULIUS GOLDMAN, OF ATLANTIC CITY, NEW JERSEY.

## AMUSEMENT APPARATUS.

Application filed August 20, 1921. Serial No. 493,966.

*To all whom it may concern:*

Be it known that I, JULIUS GOLDMAN, a citizen of the United States, and a resident of Atlantic City, State of New Jersey, have invented a new and useful Improvement in Amusement Apparatus, of which the following is a specification.

My present invention relates to apparatus especially intended for amusement and more particularly to apparatus which includes the use of vehicle construction and to an arrangement whereby a plurality of vehicles are caused to move in predetermined paths to produce an effect that will be highly interesting as well as amusing.

Although this apparatus is particularly intended as an amusement apparatus and is so illustrated and described, it will be obvious, as this description proceeds, that features thereof are capable of a wider field of utility, and the disclosure of the various features of my invention in connection with an amusement apparatus will be for purposes of convenience only as to such phases that have such wider field of utility.

As an amusement apparatus generally, my invention is intended to be in the nature of a race between vehicles to see which can arrive at a predetermined point first, the path each vehicle is to follow and the shape of each vehicle being such as to cause the greatest possible amount of interference with its progress. Furthermore the means for propelling and controlling the direction of travel of the vehicles are designed in such a way as to require the cooperation of a number of operators, and are particularly designed to render such cooperation rather complicated and amusing.

Among the more important objects of my invention are: the provision of an arrangement whereby vehicles moving from predetermined starting positions to predetermined terminal positions are compelled to follow paths which interfere and cross each other and more particularly the provision with such an arrangement of characteristics whereby the predetermined terminal position of each vehicle is indicated: the provision furthermore with a plurality of starting positions or stations and a plurality of terminal stations of indicating characteristics for each station, of such character that the indicating characteristics of the starting stations are each different, with each of those

in the terminal stations corresponding to one of those in the starting stations: the provision of vehicles arranged and constructed so that they can engage and bump each other without damage to the vehicles or discomfort to the occupants thereof; and more particularly of vehicles which are arranged and constructed to retard each other's progress as far as possible: the provision of a vehicle in which the direction of movement is adapted to be controlled by a plurality of persons, and more particularly the provision of a vehicle in which each of a plurality of persons can control the direction of movement of the vehicle independently of the other; the provision of a plural direction control for a vehicle so arranged that the controls are cumulative only when they are properly coordinated: the provision of an arrangement for propelling a vehicle which requires the coordinated effort of a plurality of persons, and more particularly one in which the plural drive of the vehicle is combined with a plural direction control thereof: the provision more particularly of vehicles designed to move through water: and the provision generally of an amusement apparatus which will provide a number of features which will be both highly interesting and entertaining as well as instructive.

In attaining the foregoing objects, and certain additional benefits and advantages that will appear or be pointed out below, I have provided a construction, one embodiment of which is illustrated in the accompanying drawings, in which—

Fig. 1 is a top plan view of a water race course with all the vehicles in starting position;

Fig. 2 is a longitudinal section through the tank of Fig. 1 taken on the line 2—2 of Fig. 1 looking in the direction of the arrows;

Fig. 2<sup>A</sup> is a transverse section through the tank taken on line 2<sup>A</sup>—2<sup>A</sup> of Fig. 1;

Fig. 3 is a view in front elevation of the vehicle used;

Fig. 4 is a view similar to that of Fig. 3, taken at right angles thereto;

Fig. 5 is a plan view of the bottom of a vehicle looking upwardly;

Fig. 6 is a top plan view looking down upon the vehicle from above;

Fig. 7 is a section through the water



course showing a slightly modified embodiment of the vehicle in central longitudinal section;

Figs. 8 and 9 are top plan and side elevational views respectively on an enlarged scale of a detail shown in Fig. 6; and

Fig. 10 is an enlarged detail in side elevation showing the modified feature of Fig. 7.

Upon viewing Figs. 1 and 2, it will be seen that I have illustrated my invention as used in connection with a body of water and the vehicles as particularly intended for use in water. This I have done because the objects of my invention will probably be most popularly served and attained in this connection, although as will be obvious, the attainment of the general objects of my invention does not necessarily require the use of my apparatus in this connection. In the drawings the water course has furthermore been illustrated as an enclosed pool or tank for purposes of convenience only, as an open body of water will serve equally well.

The enclosed pool, indicated generally by the reference character 10, has the sides 11 and the ends 12, it being intended that the path of movement of each of the vehicles participating in the race or contest start from one side and finish at the other, or if preferred, start at one side, touch at the other and return to the starting point. While in this specification, I will describe the former, this is merely for purposes of convenience. The vehicles 13 are illustrated in Fig. 1 as all on one side of the tank 10 which side can be referred to, for the moment, as the starting position of the vehicles, and as these vehicles 13 are preferably made tub-like or circular in horizontal cross section for purposes that will be pointed out, it is found preferable to have the starting and finishing positions of both sides of the pool in the form of the semi-circular berths 15, in which the vehicles 13 are received.

Where the paths to be followed by the vehicles are parallel and non-interfering, the exciting element always present in a race will be present here also, but the amusement feature will be more or less negligible. To enhance this latter feature, I have arranged that the vehicles shall interfere with and impede each other as much as possible. This end I have attained, in the embodiment illustrated, by arranging that each vehicle 13 starting from a point or berth 15 at one side must reach a predetermined berth or finishing point on the opposite side and these predetermined berths are so arranged that the vehicles must almost necessarily bump each other about the pool. For instance the five vehicles 13 shown at the right in Fig. 1 must each follow the paths indicated by the

dotted line leading therefrom, and finishing at the berth indicated by the arrow head. As can be seen from the diameter of the vehicles or boats 13, the paths to be followed, and the dimensions of the pool, the five vehicles referred to will each almost necessarily interfere first with one and then with another of the rest of the five until one of the vehicles disengages itself from the others and assumes a leading position, in which case that vehicle should ordinarily reach its goal before the others.

Upon viewing Fig. 1 it will be further noticed that provision is made in the tank for two groups of five boats each, and that the paths are so arranged that there is in effect two distinct races one between the five boats on the left and the other between the five boats on the right. Although groups of five will probably give the desired results in a very satisfactory way, it is obvious that the number may be varied with the variations in the dimensions of either the tank or the boats. By employing two groups as illustrated or more than two if desired, a double race is in fact produced, namely, a race within each group, and then a race between the leading boats of each group.

To avoid any confusion, I have thought it advisable to clearly indicate at which point or berth each boat must finish. This indication may be of any character whatsoever, such as numbers, letters, colors or shapes but for the purpose of convenience and simplicity I have illustrated the use of the numbers such as 1 to 10, as clearly shown at 20 in Fig. 1. In addition I have found it advisable to give a characteristic to each starting berth which is either similar to or corresponding to the indication or characteristic used in connection with the corresponding finishing berth or station. In the drawing I have illustrated the use of the same numbers 1 to 10 as shown at 21. In other words a boat 13 starting out from berth numbered 10 must finish at berth number 10. If desired each boat may also be given a characteristic indication which will correspond to that used in connection with its starting and finishing berths. For instance the boats can be numbered 1 to 10, boat numbered 1 starting from berth number one and finishing on the other side at berth numbered 1.

As the vehicles 13 are illustrated as used in connection with the water course 10, in other words that the vehicles 13 are in fact boats, I have provided them with propelling means which, as will be seen on viewing Figs. 3 and 4, take the form of the paddle wheel propellers 22, and with direction controlling or steering means which are illustrated in Fig. 5 as the rudders 23, 24.

As can be seen from the drawings, the

boats or vehicles 13 are each preferably circular or tub like in shape, and are each provided in its lower half with the diametrical through passage 25 open to the water at both ends and below. The propelling and steering apparatus of each boat 13 is positioned in this passage 25 and perform their desired functions in connection with the water in said passage.

Due to the character of paths to be followed by the different boats 13, the interference of one boat with another will only infrequently be in the form of a "head on bump or collision", and will generally be a "side swipe" (i. e., a blow whose line of force is not diametrically through the bumping boats.) Due to the circular shape of the boats, a blow of this character will tend to spin the boats about their vertical axes somewhat as shown by the arrows and dotted line boats in Fig. 1.

When therefore the boats begin bumping each other, they will be diverted from their desired directions of movement, if not also from the shortest path and as the boats are of a character which do not quickly answer to the rudder, it will require considerable maneuvering to bring the boats around to the desired direction of movement, which as is obvious is in a line with the passage 25. To minimize the effect of the blow as the boats 13 bump into each other, each boat is provided with the circumferential spring bumper 26, which acts as a shock absorber.

As will be seen upon viewing Fig. 5 of the drawing, two rudders 23, 24 are illustrated, these rudders being supported in the passage 25 toward what will hereafter be referred to as the rear of the boat. These rudders are each swingingly mounted upon one of the vertical posts 27, 28, fixed between the cross piece 29 and the upper wall 30 of the passage 25. These rudders 23, 24 are positioned symmetrically of the passage 25, one to each side of the vertical median line through the passage 25.

Pivoted to the front end of each rudder 23, 24 at 31, 32 are the outwardly oppositely extending links 33, 34 to the free ends of which at 35, 36 are pivoted the cranks 37 and 38 each secured to the lower end of the vertical steering posts 39, 40 extending through the bottom 41 of the boat 13 on opposite sides of the passage 25. These steering posts 39, 40 are operated by the steering wheels 42, 43. It will therefore be seen that I have thus provided a direction control for the vehicle 13 which can be independently controlled by each of a number of persons. Furthermore unless these controls are all operated in the same direction the effects thereof will negative each other. In other words, the steering of the boat will be effective only to the extent to which the operation of both steering wheels 42, 43 is co-

ordinated. Although the use of two rudders each controlled by a separate person has been illustrated in the drawing, it is obvious that the number of controls can be increased to require a greater number of persons, and the rudder construction may be so arranged that a single rudder can be controlled by the resultant of the movement of two or more controls.

Although the vehicle may be propelled in any desired or preferred manner, it will be found that propelling means such as I will not proceed to describe are additionally effective for attaining the desired objects. As the vehicle has been illustrated and described as used in connection with fluid such as water, in other words as a boat, it will be seen, upon viewing Figures 3 and 4 that I have illustrated the use of two straight bladed paddle wheels 22 mounted substantially midway of the passage 25 upon a shaft 45 rotatably supported in the walls of the passage 25, the shaft 45 being driven by a small sprocket 46 mounted intermediate the paddle wheels 22, which in turn is driven by the chain 47 passing around the large sprocket 48 fixed to the shaft 49. Fixed to the shaft 49 is the toothed wheel 50 and rotatable on the same shaft 49 is the lever arm 51 to the upper end of which is pivotally mounted at 52 the double acting pawl 53 having the engaging ends 54, 55, the pivot 52 being intermediate said ends. The double acting spring 56 has each of its ends adapted to engage and hold the corresponding end of the pawl 53 in engagement with the teeth of the wheel 50. Mounted at 57 upon the lever arm 51 is the cam lever 58 arranged to engage either on one or the other side of the spring 56 to hold such portion of the spring out of engagement with the pawl. In other words, when the cam lever 58 is in the position shown in Fig. 10, the right end 55 of the pawl 53 will be in engagement with the toothed wheel 50, and the drive of the wheel 50 will be clockwise during that portion of the pivotal movement of the lever arm 51 which is clockwise. Upon comparing Figures 7 and 10, it will be found that such clockwise movement of the wheel 50 results in a forward drive of the boat. In the same manner when the cam lever 58 is shifted so as to render the end 54 of the pawl 53 ineffective and the end 55 effective, the drive of the wheel 50 will be contraclockwise during the contraclockwise movement of the lever arm 51, and the drive of the boat will be reverse or backward.

For giving the lever 51 the desired oscillatory movement, I have provided a construction which was devised in view of my observation that a contest which calls for the coordinated efforts of a number of persons is thereby additionally interesting and

exciting, and furthermore with the aim of making the race as realistic a water contest as possible. Pivoted at 60 to the lever 51 is the link 61 which is pivoted at its other end 62 to the lower end of the bolt 63 which is arranged for relative transverse sliding movement in the superposed open ended slots 64 of the members 65. These members 65 are each pivoted intermediate its ends at 66 on the vertical posts 67 which are intended to simulate oar locks, the members 65 being intended to simulate both in structure and operation oars such as used to propel a row boat. These oars 65 are each provided at their adjacent ends with the open ends slots 64, the slotted ends of the members 65 being reversely chamfered away and overlapped as clearly shown in Fig. 9, with the slots 64 in register, and in position to receive the bolt 63. In this manner I provide a lost motion connection between the propeller and the operating means.

In Fig. 7 I have shown a modification in which the link 61 is moved back and forth by the lever 70 pivoted to the frame at its lower end 71 and to the link 61 at the intermediate point 72. This lever 70 is moved by what might be termed a hand car motion.

In the practical use of my invention, the vehicles are all lined up at the start with the necessary number of participants in each, four being provided for, in the embodiment disclosed, although as is obvious this number may be varied. For the comfort and convenience of the participants the transverse seats 74, 75 are provided. As will be seen upon viewing Fig. 6, the occupants of the front seat will take care of the vehicle propulsion, and the occupants of the rear seat 75 will take care of the vehicle steering apparatus, both of which as illustrated and described are of a character particularly intended for a water race. It is obvious however, that the objects of my invention can be attained in a land race by appropriately adapting the steering and propelling mechanism for such use. It is also obvious that the controlling and propulsion need not necessarily be manual, and that the propulsion may be motor operated.

At the starting signal, the participants each begins his allotted task, to advance his vehicle to its goal as quickly as possible. From what has been set out previously, it will be obvious that the members of each group in a vehicle will at once find themselves in difficulties due to lack of coordination, with the difficulties multiplied many times as the boats begin bumping each other not only out of their direct paths, but causes them to spin. In the embodiments disclosed, the mechanism operated by the participants is of a character to give a realistic touch

to the race, although as is obvious these also may be modified.

The mechanism for permitting of a ready shifting from the forward to the reverse drive, will be useful frequently during the race, and will be particularly useful where the race is a return race or where the boats have been spun through an angle of one hundred and eighty degrees, in which case the vehicle can be driven in the desired direction by the use of the reverse mechanism, without being compelled to resort to steering the boat back to its desired or original position.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is the following:

1. In a device of the character described, in combination, a plurality of vehicle starting stations, each having a different indicating characteristic and a plurality of terminal stations each having an indicating characteristic which corresponds to that of a starting station, the paths between a correspondingly indicated stations crossing each other.

2. In a device of the character described, in combination, a plurality of vehicle starting stations each having a different indicating characteristic, and a plurality of terminal stations each having an indicating characteristic which corresponds to that of a starting station, the paths between correspondingly indicated stations being substantially of the same length and being arranged to cross each other.

3. In a device of the character described in combination, a plurality of vehicle starting stations, and a plurality of terminal stations each having a different indicating characteristic the paths between each starting station and a terminal station having a definite characteristic being of the same length as that between another starting station and another terminal station having different characteristic.

4. In a device of the character described, in combination, a body of water, stations arranged in spaced groups, the stations in one group each having a different indicating characteristic and the stations in another group each having an indicating characteristic corresponding to that of one in the first mentioned group, the paths between correspondingly indicated stations in the two groups crossing each other whereby a vehicle passing from a station in one group to the correspondingly indicated station in another group is compelled to cross the path of another vehicle passing similarly between other stations in the two groups.

5. In a device of the character described, in combination, a body of water, stations ar-

5 ranged in spaced groups, the landing stations in one group each having a different indicating characteristic, and the landing stations in another group each having an indicating characteristic corresponding to that of one in the first mentioned group, the paths between correspondingly indicated stations in the two groups crossing each other whereby a vehicle passing from a station in one group to the correspondingly indicated station in another group is compelled to cross the path of another vehicle passing similarly between stations in the two groups, the paths between correspondingly indicated stations being of the same length.

6. In a device of the character described, in combination, a plurality of starting stations, and a plurality of terminal stations, and a plurality of members, each to be moved from a starting station to a terminal station, the whole being so arranged and constructed that each member is to be moved from a starting station to a predetermined terminal station, the paths of the members crossing each other.

7. In a device of the character described, in combination, stations arranged in groups, and a plurality of members each arranged to move from a station in one group to a predetermined station in another group, the paths of the members crossing each other.

8. In a device of the character described, in combination, a plurality of vehicles, and a race course therefor having a different path for each vehicle all arranged and constructed so that the paths of the vehicles cross each other.

9. In a device of the character described, in combination, a plurality of vehicles, and a race course therefor having a different path for each vehicle all arranged and constructed so that the paths of the vehicles cross each other, the vehicles each having a circular exterior wall.

10. In a device of the character described, in combination, a vehicle having its outer wall circular, and steering and propelling

means therefor arranged in alignment diametrically of the vehicle.

11. In a device of the character described, in combination, a plurality of vehicles, the vehicles each having its outer wall circular, steering and propelling means therefor arranged in alignment diametrically of the vehicles, and a race course therefor arranged and constructed so that the paths of the vehicles cross each other.

12. In a device of the character described, in combination, a plurality of groups of vehicles, and a race course having a group of paths for each group of vehicles all arranged and constructed so that the paths of the vehicles of each group cross each other.

13. In a device of the character described, in combination, a vehicle, propelling means and steering means therefor, each requiring the coordinated efforts of a plurality of persons.

14. In a device of the character described, in combination, a water vehicle having its outer wall circular and propelling means therefor arranged centrally of said outer wall.

15. In a device of the character described, in combination, a water vehicle having its outer wall circular and propelling means therefor arranged centrally of said outer wall, said propelling means being arranged to operate diametrically of the vehicle.

16. In a device of the character described, in combination, a water vehicle, propelling means therefor comprising oar like members, and manually controlled means for causing the propelling means to drive either forwardly or rearwardly at will.

17. In a device of the character described, in combination, a water vehicle, a propeller, means operating said propeller comprising a plurality of oscillating members, and a lost motion connection between the propeller and said means.

In witness whereof, I have hereunder signed my name this 11th day of August, 1921.

JULIUS GOLDMAN.



April 7, 1925.

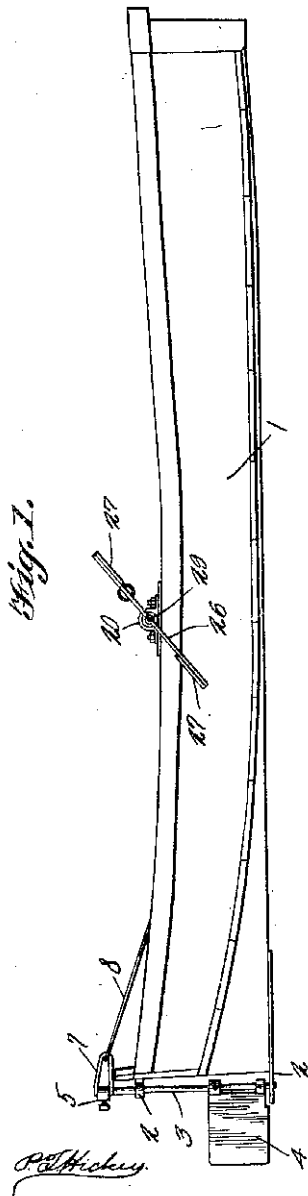
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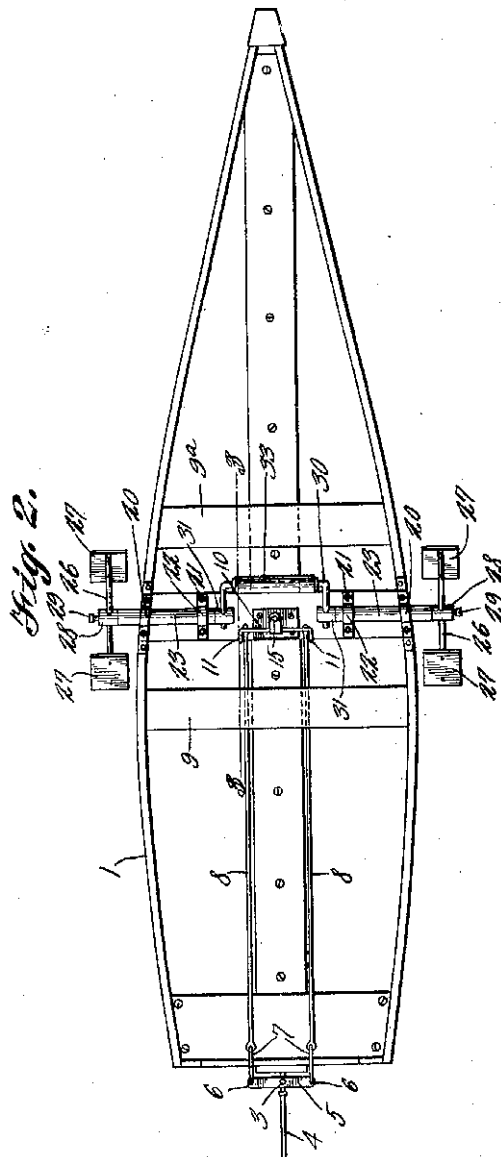
BOAT

Filed Sept. 24, 1924

2 Sheets-Sheet 1



WITNESS:



April 7, 1925.

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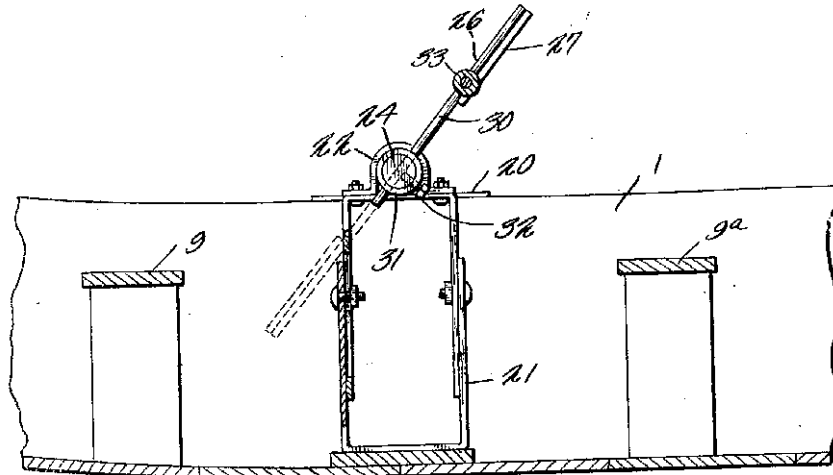
G. CSENGERY

BOAT

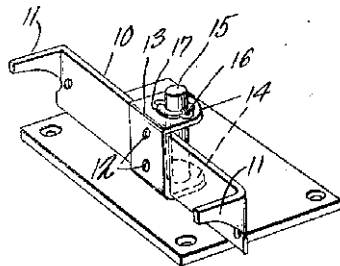
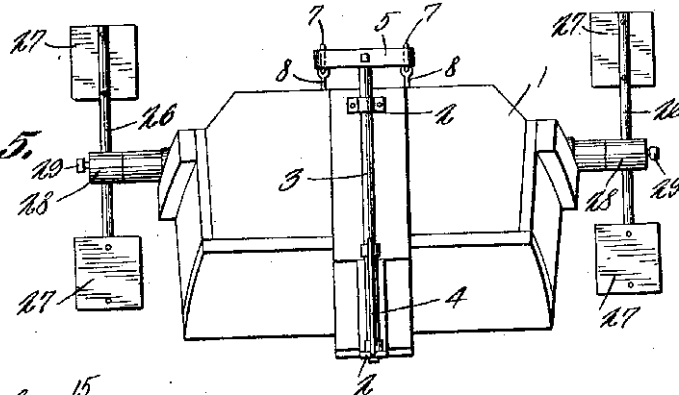
Filed Sept. 24, 1924

2 Sheets-Sheet 2

*Fig. 3.*



*Fig. 5.*



*Fig. 4.*

*J. P. McKee.*

WITNESS:

George Csengery, INVENTOR  
BY Victor J. Evans, ATTORNEY

Patented Apr. 7, 1925.

1,532,990

# UNITED STATES PATENT OFFICE.

GEORGE CSENGERY, OF SOUTH NORWALK, CONNECTICUT.

BOAT.

Application filed September 24, 1924. Serial No. 739,673.

*To all whom it may concern:*

Be it known that I, GEORGE CSENGERY, a citizen of the Republic of Hungary, residing at South Norwalk, in the county of Fairfield and State of Connecticut, have invented new and useful Improvements in Boats, of which the following is a specification.

My present invention pertains to boats of the kind that are designed to be propelled and steered by one or more persons, and one of its objects is the provision of manually operable propelling means that is simple, inexpensive, strong and efficient.

Another object of the invention is the provision of steering means adapted to be readily controlled by a single person without interfering in any degree with the effort of such person in propelling the boat.

To the attainment of the foregoing, the invention consists in the improvement as hereinafter described and definitely claimed.

In the accompanying drawings, forming part of this specification:—

Figure 1 is a side elevation showing a boat equipped with the preferred embodiment of my invention.

Figure 2 is a top plan view of the same.

Figure 3 is a detail longitudinal vertical section taken in the plane indicated by the line 3—3 of Figure 2.

Figure 4 is a detail perspective of the pedal lever employed in the steering of the boat.

Figure 5 is a rear end elevation of the boat.

Similar numerals of reference designate corresponding parts in all of the views of the drawings.

The hull 1 of the boat may be and preferably is of the ordinary well known type such as generally employed in row boats.

Journalled in suitable bearings 2 at the stern of the boat is a substantially upright shaft 3, equipped on its lower portion with a rudder 4 and on its upper end with a T-head 5.

Pivotally connected at 6 to the T-head 5 are open links 7 with which are interlocked forwardly extending rods 8. These rods 8 extend under and forwardly beyond the rear intermediate seat 9 of the boat and are interlocked at their forward ends with the apertured end portions of a pedal lever 10. The said pedal lever 10 is disposed on the bottom of the hull and slightly in advance

of the seat 9 and in addition to the apertured end portions alluded to the lever 10 is provided with rearwardly deflected end portions 11, the said end portions 11 being designed to prevent the feet of an operator from slipping off the lever. As best shown in Figure 4 the lever 10 is riveted at 12 or is otherwise fixed to a body 13 formed like the lever of appropriate metal and provided with lower and upper apertured flanges 14. These latter receive an upright shaft 15 on the bottom of the hull so as to enable the body 13 and the lever 10 to freely swing about the shaft, and the body is secured on said shaft 15 by a cotter pin 16 and washer 17 or other appropriate means in the discretion of the manufacturer.

Manifestly when disposed on the seat 9 an operator is enabled with his feet to conveniently steer the boat and this without requiring any action whatever with his or her hands.

Fixedly secured on the gunwales of the hull 1 are holders 20 and fixedly secured on the bottom of the hull and spaced inwardly from said gunwales are standards 21 on the upper ends of which are holders 22 in coincidence with the holders 20. The said holders are arranged in transverse alignment and each pair of holders 20 and 22 receives a sleeve 23 which is held against turning in the holders by the clamping action of the holders or otherwise in the discretion of the manufacturer.

Journalled in the sleeves 23 are transverse shafts 24, and fixed to the shafts 24 outwardly beyond the sleeves 23 are rods 26 which are equipped with propelling blades at 27. In the attachment of the said rods 26 according to the preferred embodiment of my invention, the said rods are passed diametrically through the shafts 24 and also through collars 28 on the end portions of the shafts, and are fixed to the shaft by said screws 29 which bear in the ends of the shafts 24 as illustrated.

The inner ends of the shafts 24 are spaced apart a considerable distance as appears in Figure 2, and to said inner end portions of the shafts 24 are connected the arms of a U-shaped handle 30. In the preferred embodiment of the invention the said handle arms are extended diametrically through the shafts 24 and also through collars 31 on the shafts and both handle and collars are adjustably fixed to the shafts by set screws 32.



The adjustable connection of the handle 30 to the shafts 24 is particularly advantageous inasmuch as it permits of the transverse portion of the handle 30 being conveniently arranged relative to the seat 9 and also to a seat 9<sup>a</sup> arranged at the opposite side of the vertical plane of the shafts 24 with reference to the seat 9.

A roller 33, preferably of wood, fiber or the like, is mounted on the transverse portion of the handle 30 so as to freely turn about the said transverse portion. The said roller 33 which constitutes a hand grasp is of considerable length so that the occupants of both of the seats 9 and 9<sup>a</sup> may participate in the rotation of the shafts 24 and the propellers through the medium of the hand grasp or roller 33 and the handle 30. It will also be readily apparent that the boat may be propelled and steered by a single person irrespective of whether such person is on the seat 9 and is facing forward or is on the seat 9<sup>a</sup> and is facing rearward. I would have it understood, however, that the general arrangement disclosed is provided in order that two persons seated on the two seats 9 and 9<sup>a</sup> may participate in the propulsion of the boat while the person on the seat 9 and facing forwardly has for his or her province to steer the boat through the medium of the pedal lever 10.

It will be appreciated from the foregoing that my improvement while highly efficient for the purposes indicated does not detract in any measure from the finished appearance of a boat, but on the other hand is calculated to enhance such finished appearance.

I have specifically described the preferred embodiment of my invention in order to impart an exact understanding of said embodiment. I do not desire, however, to be understood as confining myself to the construction and relative arrangement of the parts as disclosed inasmuch as the scope of my invention is defined by my appended claims within which changes or modifications may be made without departure from my invention.

Having described my invention, what I claim and desire to secure by Letters Patent, is:—

1. The combination of a boat hull, a shaft journaled in bearings on the stern of the hull and having a rudder and also having a T-head, a horizontally swinging pedal lever mounted on the bottom of the hull; and rods connected with the T-head of the rudder and the end portions of the said pedal lever; the said T-head having apertured end portions; and the said rods being connected with the T-head by open links interlocked with the rods and having portions journaled in the ends of the T-head.

2. The combination of a boat hull, a shaft journaled in bearings of the stern of the hull and having a rudder and also having a T-head, a horizontally swinging pedal lever mounted on the bottom of the hull; and rods connected with the T-head of the rudder and the end portions of the said pedal lever, the said pedal lever having rearwardly deflected end portions, and being fixed to the intermediate portion of a body having upper and lower apertured flanges, and the said flanges of the body being mounted on and adapted to swing about a shaft fixed to and rising from the bottom of the hull.

3. The combination of a boat hull having gunwales, holders fixed on said gunwales, standards fixed on the hull bottom and spaced inwardly from the gunwales, holders on said standards and arranged in coincidence with the first-named holders, the said standards being spaced a considerable distance apart, sleeves secured in the said holders and spaced apart, shafts journaled in said sleeves and spaced apart, propellers having rods extending diametrically through the outer portions of said shafts and also having blades on the rods, set screws bearing in the outer ends of the shaft and against said rods, a U-shaped handle having a transverse portion and also having end portions extending diametrically through the inner end portions of the shafts, set screws bearing in said shafts and adjustably fixing the handle thereto, and a roller mounted on the transverse portion of the handle.

In testimony whereof I affix my signature.  
GEORGE CSENGERY.

**June 8, 1926.**

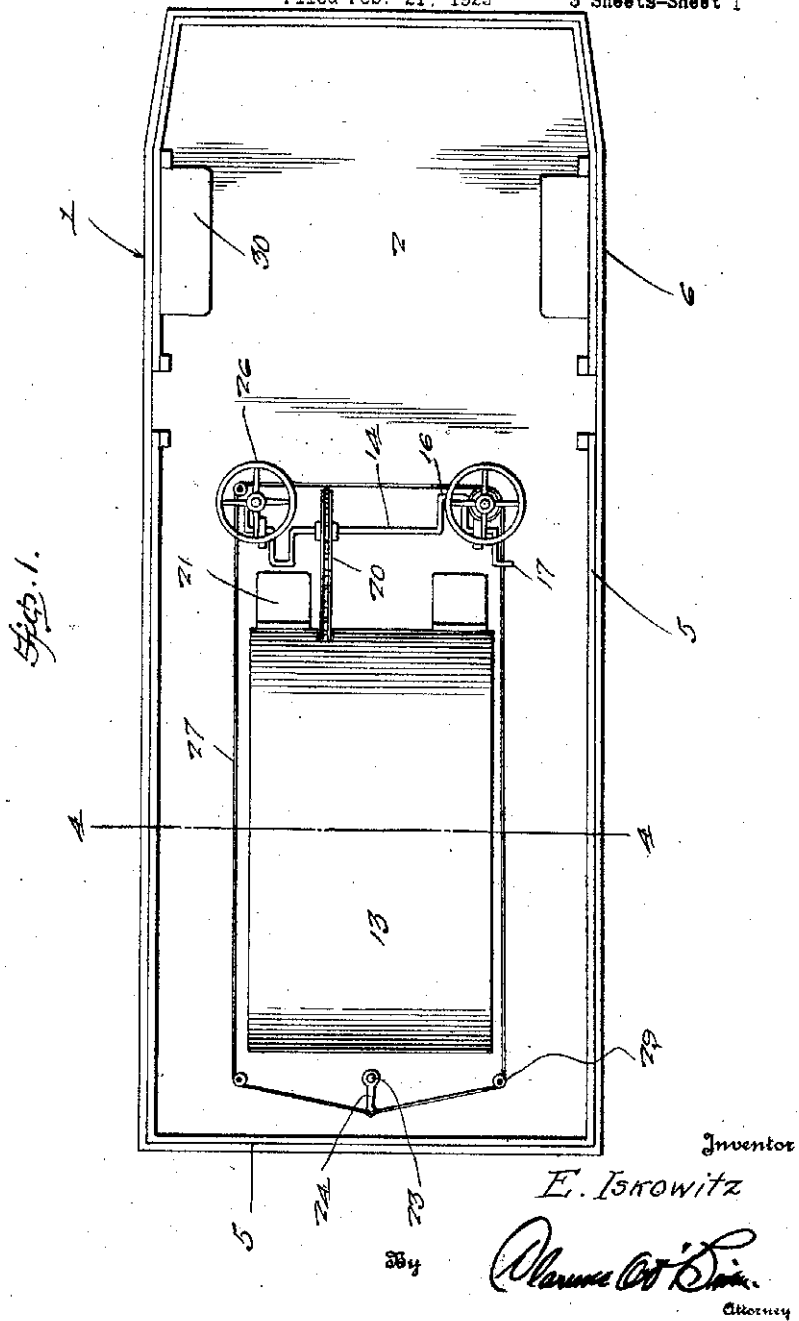
**1,587,732**

E. ISKOWITZ

MARINE PEDOMOTOR

Filed Feb. 21, 1925

3 Sheets-Sheet 1



June 8, 1926.

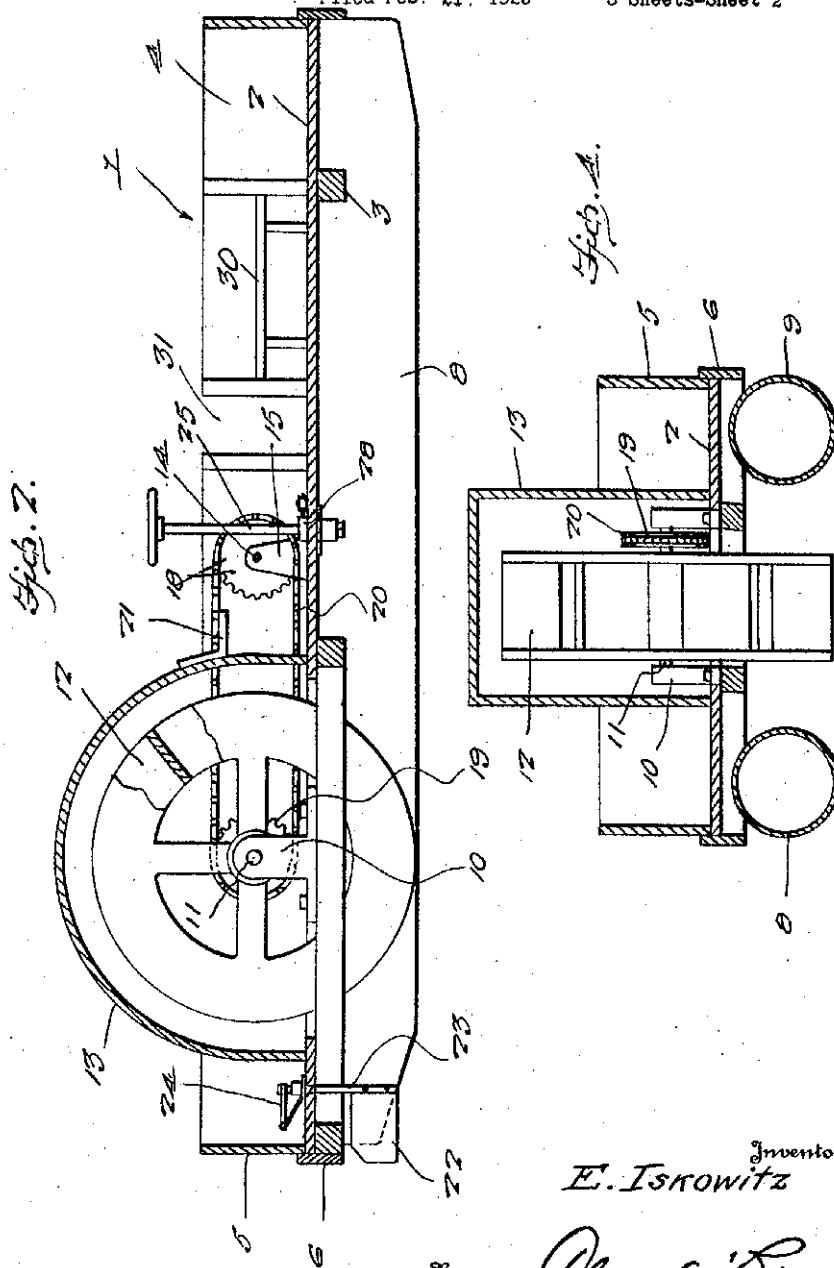
1,587,732

E. ISKOWITZ

MARINE PEDOMOTOR

Filed Feb. 21, 1925

3 Sheets-Sheet 2



Inventor  
E. ISKOWITZ

Attorney  
Charles C. Smith

June 8, 1926.

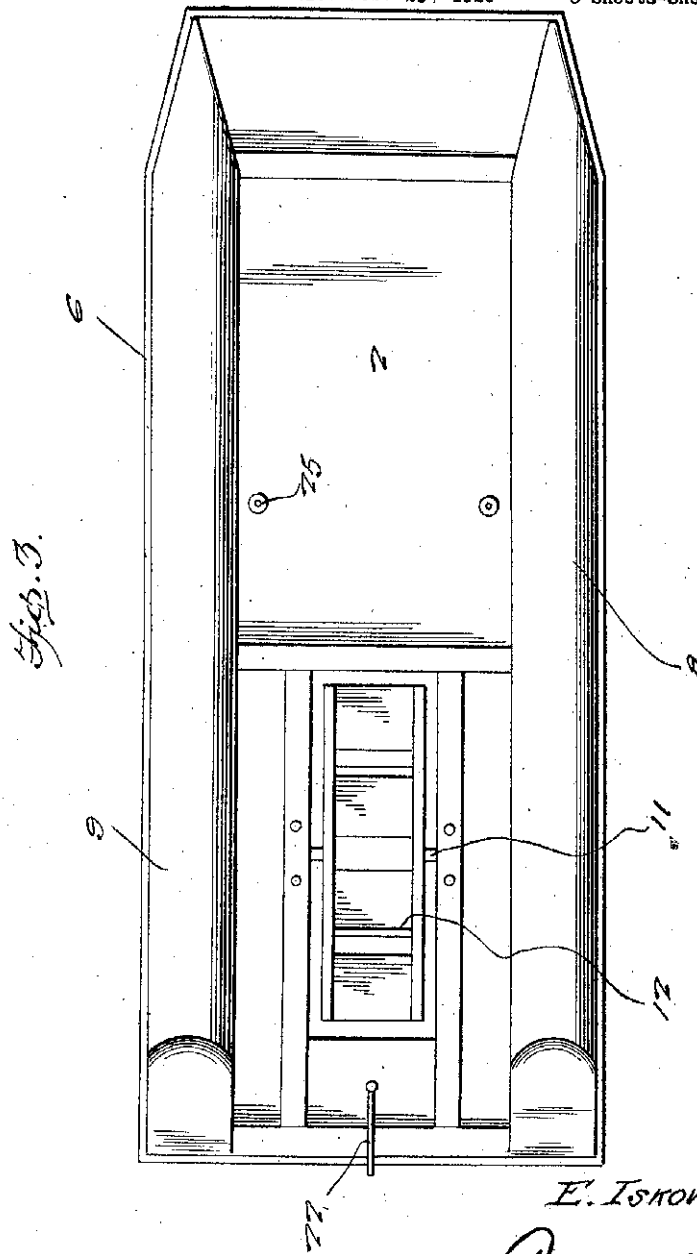
1,587,732

E. ISKOWITZ

MARINE PEDOMOTOR

Filed Feb. 21, 1925

3 Sheets-Sheet 3



Inventor

E. ISKOWITZ

*Charles A. Smith*

Attorney

## UNITED STATES PATENT OFFICE.

ELLIS ISKOWITZ, OF BALTIMORE, MARYLAND.

MARINE PEDOMOTOR.

Application filed February 21, 1925. Serial No. 10,845.

This invention relates to improvements in water boats and more particularly to a marine pedomotor.

One of the important objects of the present invention is to provide a marine pedomotor which may be easily and efficiently operated, the same being further simple in construction, inexpensive, and furthermore adapted for the purposes for which the same is designated.

Other objects and advantages of this invention will become apparent during the course of the following description.

In the accompanying drawing forming part of this specification and in which like numerals designate like parts, throughout the same:

Figure 1 is a top plan view of the boat embodying my invention.

Fig. 2 is a central longitudinal sectional view thereof.

Fig. 3 is a bottom plan view, and

Fig. 4 is a cross sectional view taken approximately on the line 4—4 of Fig. 1.

In the accompanying drawings wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates generally the water boat, the same comprising the floor 2, the same being secured on the cross beam 3. The sides and ends of the boat are designated at 4 and 5 respectively. The boat is substantially rectangular in design as clearly illustrated in the drawings. Suitable reinforcing means 6 extends around the sides and ends of the boat adjacent the floor 2.

The rear portion of the floor is cut out as illustrated at 7, the cut out portion being arranged intermediate the side of the boat and between the longitudinally extending air tanks 8 and 9 which are supported on the bottom of the boat for rendering the same buoyant. The forward ends of the air tanks have their sides tapered while the rear ends of the air tanks have their bottoms flattened and incline upwardly.

A pair of supporting brackets 10 are secured on opposite sides of the opening 7 intermediate the ends thereof. A shaft 11 is journaled at its respective ends in the upper portions of the brackets. Carried by the shaft 11 is the paddle wheel 12, the same being of any well known construction and being adapted for operation within the opening 7. A substantially semi-circular casing

13 extends over the paddle wheel and the supporting bracket for the shaft thereof.

A crank shaft 14 is supported transversely on the spaced brackets 15 provided therefor at a point forwardly of the paddle wheel 12 and casing 13 therefor. A pair of hook cranks 16 and 17 is provided at each end of the crank shaft 14 and clearly illustrated in Fig. 1 and the purpose thereof will hereinafter be more fully described.

A sprocket wheel 18 is secured on the intermediate portion of the crank shaft 14 and a similar sprocket wheel 19 is secured on the shaft 11 which supports the paddle wheel 12, the aforementioned sprocket wheel being in alignment and adapted to extend thereover is the sprocket chain 20. This provides a means whereby the crank shaft 14 when actuated through the medium of the foot crank will transmit rotary motion to the shaft 11 and the paddle wheel 12. It is of course to be understood that the forward end of the casing 13 is provided with suitable openings to accommodate the passage of the sprocket chain therethrough so as to interfere with the operation of the paddle wheel when the casing is in its normal position thereover.

A pair of supporting feet 21 are arranged on the forward end of the casing as clearly illustrated in Figs. 1 and 2 of the drawings. The feet are arranged adjacent the foot cranks provided at each end of the crank shaft so that two persons may be seated in such a position as to facilitate the actuation of the crank shaft 14 through the medium of the foot cranks 16 and 17.

The usual rudder 22 has its post 23 extending upwardly through the floor 2 at the stern of the boat. An arm 24 extends laterally from the upper end of the post and provides a means for controlling the movement of the rudder. A pair of steering posts 25 having their lower ends extending through the bottom 2 of the boat 1 adjacent the respective ends of the crank shaft. Steering wheels 26 are mounted on the upper ends of the steering posts and are adapted to be actuated by the occupants of the seats 21.

A cable 27 is associated with the free end of the laterally extending arm 24 and is attached to a suitable drum 28 mounted on the lower end of one of the steering posts, suitable guide pulleys 29 being provided in connection with the cable 27. This construction

enables the boat to be steered in a simple and efficient manner. Additional feet 30 are arranged at the sides of the bow of the boat. Access to the boat is had by way of the passages 31.

In operation, either one or two persons may propel the boat and by being seated on the feet 21, the feet of the occupants will be each in engagement with the foot cranks of the crank shaft and by operation of the same, the crank shaft 14 will transmit rotary motion to the shaft 11 and the paddle 12, thereby causing the paddle wheel to rotate and in turn move the boat along the surface of the water.

It will thus be seen from the foregoing description that a marine pedomotor has been provided which may be efficiently and easily operated, the same being further of such construction as to render it strong and durable.

While I have shown the preferred embodiment of my invention, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention and the scope of the appended claim.

Having thus described my invention, what I claim as new is:—

In a marine pedomotor including a floor, side and end walls extending upwardly from the floor, a pair of air tanks extending longitudinally on the bottom of the floor, said floor being provided with an enlarged opening, a pair of upstanding brackets secured on the floor adjacent the longitudinal sides of the opening, a transverse shaft journaled at its respective ends in the upper portions of the brackets, a paddle wheel mounted on said shaft and extending through the opening, a casing over said paddle wheel and said bracket, a crank shaft supported forwardly of the casing and arranged parallel with respect to the aforementioned shaft, aligning sprocket wheels on the respective shafts, a sprocket chain extending over the sprocket wheels and adapted to extend through an opening provided therefor in the front side of the casing, foot cranks on the crank shaft for actuating the same, and means for steering the pedomotor.

In testimony whereof I affix my signature.

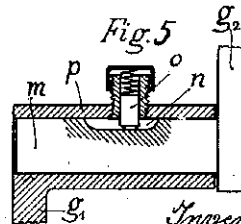
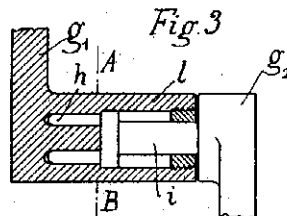
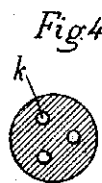
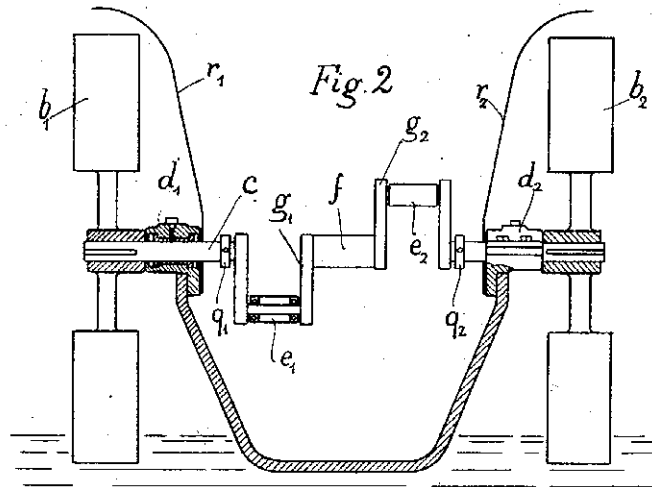
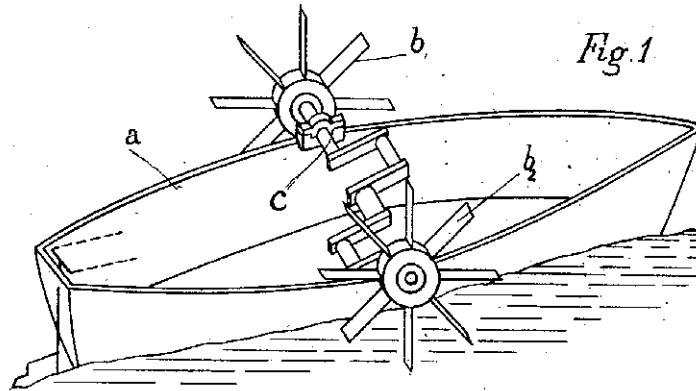
ELLIS ISKOWITZ.



Sept. 14, 1926.

1,600,084

J. G. ADOLPH  
HAND PROPELLED BOAT  
Filed May 14, 1925



Inventor.  
Joseph Gustave Adolph.  
per: *[Signature]*  
Attorney.



## UNITED STATES PATENT OFFICE.

JOSEPH GUSTAVE ADOLPH, OF MULHOUSE, FRANCE.

## HAND-PROPELLED BOAT.

Application filed May 14, 1925, Serial No. 30,372, and in France July 15, 1924.

The present invention relates to an improved boat propelled by means of paddle-wheels operated by hand by the user. In order that the invention may be more readily understood, it will now be further described with the aid of the accompanying drawing, wherein:—

Figure 1 is a diagrammatic perspective view of the hand-propelled boat according to the invention,

Figure 2 is a transverse section through the said boat,

Figure 3 is an axial section through a disengageable coupling between two cranks by means of which the paddle-wheels are driven,

Figure 4 is a cross-section taken on the line 4—4 of Figure 3, and

Figure 5 is a longitudinal section through a modified form of the said coupling.

Referring to the said drawing, a paddle-wheel  $b^1$  or  $b^2$  is arranged on each side of the hull  $a$  of the boat. These paddle-wheels are driven by the user of the boat through the medium of two cranks  $g^1$  and  $g^2$  connected to the respective inner ends of the two sections of a shaft  $c$  of which the outer ends carry the paddle-wheels  $b^1$  and  $b^2$  and which is supported in bearings  $d^1$  and  $d^2$  fixed to the sides of the hull  $a$ . The crank pins of the cranks  $g^1$  and  $g^2$  have tubular hand-grips  $e^1$  and  $e^2$  mounted thereon, ball bearings being interposed between said crank pins and the said hand-grips. The two cranks are connected by means of a disengageable coupling  $f$ , in such manner that when the said coupling is in the engaged position both paddle-wheels are rotated together by operating the two cranks  $g^1$  and  $g^2$  while when such coupling is in the disengaged position each paddle-wheel may be driven independently from the other for the purpose of causing the boat to turn to the right or to the left respectively, i. e. for steering the craft.

In the form of coupling illustrated by Figures 3 and 4 the two members of the coupling consist respectively of a hollow cylindrical member  $l$  integral at one end with one of the cranks ( $g^1$ ) and open at the other end, and of a journal-like member  $i$  integral with the adjacent side of the other crank ( $g^2$ ) and which engages and is axially slid-

able in the hollow cylindrical member  $l$ , the said journal-like member  $i$  being at its free end provided with three pins  $h$  capable of engaging corresponding recesses  $k$  formed in the closed end of the hollow cylindrical member  $l$ . For bringing the coupling in position of engagement, the pins  $h$  are inserted in the recesses  $k$  by bringing the two cranks  $g^1$  and  $g^2$  closer to each other, and for disengaging the coupling, the pins  $h$  are caused to slide out of the said recesses  $k$  by moving the two cranks  $g^1$  and  $g^2$  away from each other.

In the modified form of coupling illustrated by Fig. 5, one of the cranks ( $g^1$ ) is on its side nearer the other crank provided with an integral hollow sleeve  $p$  in which is slidably inserted a cylindrical member  $m$  integral with the adjacent side of such other crank ( $g^2$ ), and the said sleeve  $p$  carries a radially slidable pin  $o$  subjected at its outer end to the action of a coil spring and which is by means of a screwed cap pressed into engagement with a longitudinal groove  $n$  cut in the aforesaid cylindrical member  $m$ . This groove has sloping ends so that by moving the two cranks  $g^1$  and  $g^2$  away from each other, the pin  $o$  may be caused to come out of engagement with the said groove  $n$  so that the sleeve  $p$  and the cylindrical member  $m$  may be rotated independently of each other. The extent to which the cranks  $g^1$  and  $g^2$  may be moved away from each other for the purpose of disengaging the coupling  $f$  is suitably limited by means of collars  $q^1$  and  $q^2$  provided close to said cranks on the respective sections of the shaft  $c$  and which, when the two cranks are moved away from each other come to bear against the inner faces of the bearings  $d^1$  and  $d^2$ . Protector-plates  $r^1$  and  $r^2$  secured to the sides of the hull  $a$  are provided to protect the user of the boat against the spray caused by the paddle-wheels  $b^1$  and  $b^2$ .

I claim:—

In a hand-propelled boat, the combination with a hull of two lateral paddle-wheels, two aligned shaft-sections carrying at their outer ends the respective paddle-wheels and supported in bearings fixed to the sides of the hull, a driving crank connected to the inner end of each of said shaft-sections, and disengageable coupling means between the two

cranks, said means including a hollow cylindrical member integral at one end with one of said cranks and open at the other end and a journal-like member, integral with the adjacent side of the other crank, slidably engaging in the hollow cylindrical member of the first-named crank and provided at its

free end with pins capable of engaging corresponding recesses formed in the closed end of the said hollow cylindrical member.

In testimony whereof I sign hereunto my name.

J. A. GUSTAVE.

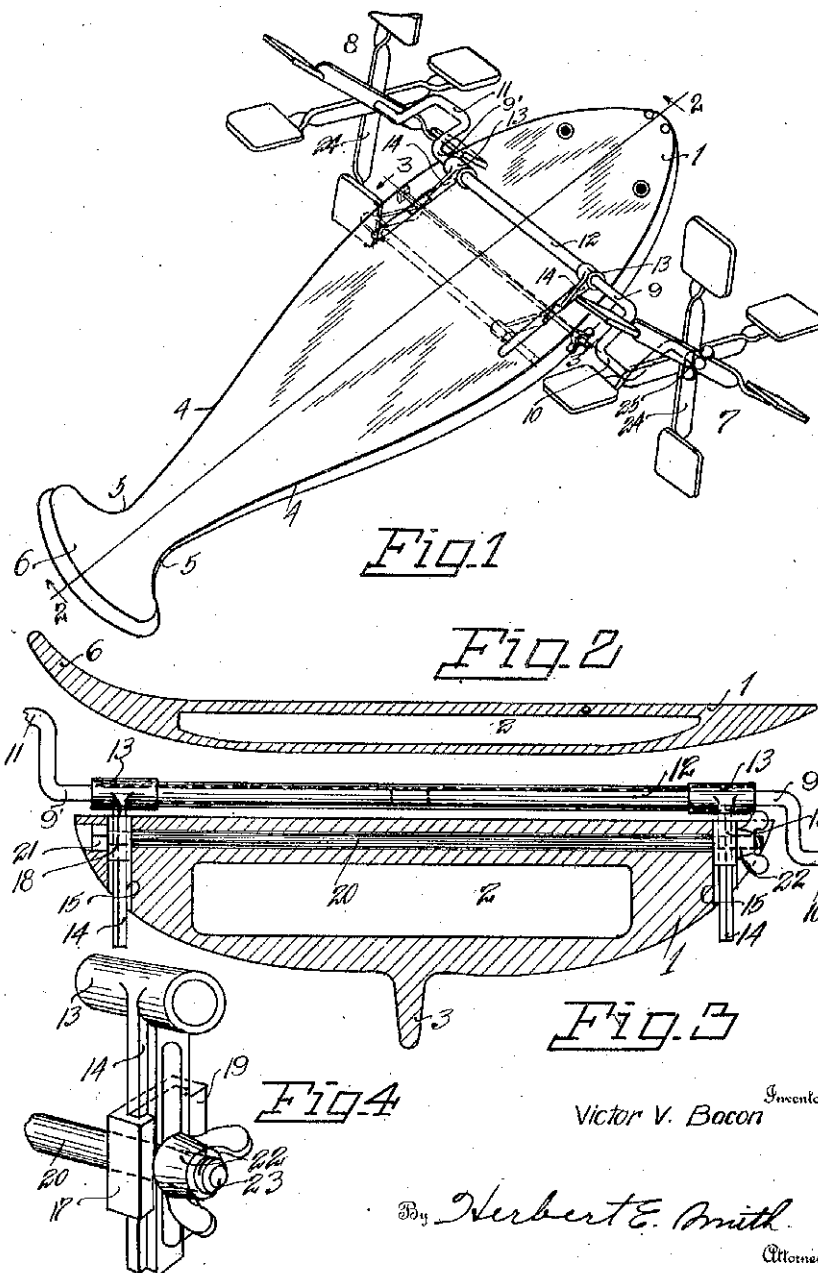
Aug. 30, 1927.

V. V. BACON

1,640,390

SWIMMING APPLIANCE

Filed June 12, 1926



Victor V. Bacon <sup>Inventor</sup>

By *Herbert E. Smith* <sup>Attorney</sup>

Patented Aug. 30, 1927.

1,640,390

# UNITED STATES PATENT OFFICE.

VICTOR V. BACON, OF SPOKANE, WASHINGTON.

## SWIMMING APPLIANCE.

Application filed June 12, 1926. Serial No. 115,637.

My present invention relates to an improved swimming appliance adapted especially for aquatic sport and for beginners who are learning to swim. The appliance comprises a buoyant body upon which the operator may be supported in position to manually operate paddle wheels for the mechanical propulsion of the appliance, and means are provided in the propulsion mechanism whereby the appliance may be steered or guided by selective use of the paddle wheels. Means are also provided for adjusting the appliance to the size of the operator, and the operator is supported on the buoyant body in usual swimming position with the hands free to operate the propelling mechanisms.

The invention consists in certain novel combinations and arrangements of parts involving the body of the appliance and the propulsion mechanism as will hereinafter be more fully pointed out and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a perspective view of an appliance embodying my invention wherein the hollow, buoyant body, having the shape of a fish is equipped with the manually operated propulsion mechanism.

Figure 2 is a longitudinal sectional view through the buoyant, hollow, air-tight and water-tight body of the appliance.

Figure 3 is a transverse sectional view at line 3—3 of Figure 1.

Figure 4 is a detail perspective view of one of the bearing-supports for the propulsion mechanism, showing the adjusting means therefor.

In the preferred form of my invention I utilize a body 1 fashioned from suitable light material and preferably in the form of a fish, having an interior air, and water tight compartment 2 extending substantially throughout its length, and a keel portion 3 at its underside. Toward the rear of the body its sides converge as indicated at 4, 4, and the narrowest portion, between side edges 5, 5, is straddled by the operator who sits upon the fan-shaped, up-turned tail portion 6, facing of course toward the forward end of the body. In use, the operator

assumes the position of a swimmer, straddling the rear end of the body of the device and lying prone upon the body 1 which is thus made to take an angular position with relation to the water level and submerged sufficiently below the level of the water in order that the paddle wheels 7 and 8 may be effective in propelling the appliance. The wheels are located at opposite sides of the forward end of the body and are rotated or revolved so that their lower blades will pass through the water for propelling the appliance. Each paddle wheel has a crank-shaft section as 9 and 9' and these respective sections are fashioned with cranks 10 and 11 to be grasped by the right and left hands respectively.

The two sections 9 and 9' of the crank shaft thus form a sectional shaft disposed transversely of the appliance and they are supported to revolve in a long bearing sleeve 12, it being understood that the paddle wheels are thus independently revoluble by the use of the cranks. Thus the right paddle wheel may be turned to propel the appliance and the left wheel remain idle for steering purposes, or the operator may "back-water" with one paddle wheel and forwardly rotate the other wheel, if desired.

The long bearing sleeve is disposed across the upper face of the body of the appliance and is supported at its ends in bearing collars 13, 13, each of which is integral with or fixed to a bracket arm 14 that extends through a slot 15 in the body of the appliance and located near one of its sides. The bracket arms extend through the slots at a slight angle to the flat upper face of the body of the appliance and they are supported in such manner that the arms and the crank shaft with its paddle wheels, may be adjusted toward or away from the seat or saddle portion 6 at the tail of the body. For a small person, the crank shaft and arms are drawn or turned to the dotted line position of Figure 1, and for a larger person the crank shaft and paddles are disposed as shown in full lines.

An additional adjustment of the crank arms is secured by the use of slots 16 that extend longitudinally of the bracket arms as will be described. The slotted bracket arms are slidable for adjustment in supporting blocks 17 and 18, each of which has a pair of opposed retaining and guide flanges 19 for the arms. The blocks are perforated for

the accommodation of a bolt 20 that is passed through the blocks and extends transversely through a bolt hole in the body of the appliance. At one end the bolt is fashioned with a head 21 engaging the outer side of the block 19, and a nut 22 is threaded upon the opposite end 23 of the bolt and adapted to frictionally engage the outer face of the flanged block 17. Thus the blocks in the slots 15 of the body 1 may be retained in fixed position by clamping the nut 22 on the bolt end, but when the nut is loosened the slotted bracket arms may be slid in their retaining blocks to adjust the crank shaft toward or away from the retaining bolt 20. By this adjustment the cranks of the crank shaft may be moved beyond the full line position of Figure 1 to adapt the appliance for a person with a longer stretch of the arms, or the cranks of the crank shaft may be moved nearer than the dotted position to the tail of the appliance for a person with a shorter reach.

In this manner the crank shaft and paddle wheels may be swung on the retaining bolt as a pivot for adjustment with relation to the body of the appliance, or the crank shaft may be adjusted as to distance with relation to the retaining bolt 20 through the slotted connection of the bracket arms with the bolt and blocks, thus adapting the appliance for use by persons of various sizes and ages.

It will be noted that the twisted shanks 24 of the paddle wheels each has a pair of blades at its ends and the shanks which are centrally perforated are retained on the outer ends of the respective crank-shaft sections by thumb nuts 25. When not in use the three shanks may be swung on the shaft ends into alignment and the nuts tightened to provide a compact formation for the wheels in order to reduce required space for storing the appliance. It will also be apparent that the propelling mechanism may be detached with facility from the body of the appliance when necessary by removal of

the thumb nut 22 and bolt 20 to release the retaining blocks and bracket arms of the propelling mechanism.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is—

1. The combination with a buoyant body having a narrow tail portion and an enlarged upturned seat portion forming an extension thereof, of a pair of paddle wheels, and manually operated, mechanical propulsion mechanism adjustably supported on said body for said wheels.

2. In a swimming appliance the combination with a buoyant body having a converging rear end and an upturned and enlarged extension forming a seat or saddle, and manually operated, mechanical propulsion mechanism supported on said body, for the purpose described.

3. The combination with a buoyant support having a bearing sleeve supported in adjustable relation and transversely thereof, of a sectional crank shaft journaled in said bearing sleeve, and paddle wheels mounted on the opposite ends of said crank shaft.

4. The combination with a buoyant support having spaced, adjustable bracket arms, of a transversely disposed bearing sleeve supported on said arms, a sectional crank shaft journaled in the sleeve, and paddle wheels mounted at the opposite ends of said shaft.

5. The combination with a buoyant body having slots therein and slotted bracket arms on said slots, of retaining blocks for said arms and a retaining bolt passed through said arms and blocks, collars on said arms and a bearing sleeve supported in said collars, a sectional crank shaft journaled in the sleeve, and paddle wheels on the outer ends of said shaft.

In testimony whereof I affix my signature.

VICTOR V. BACON.



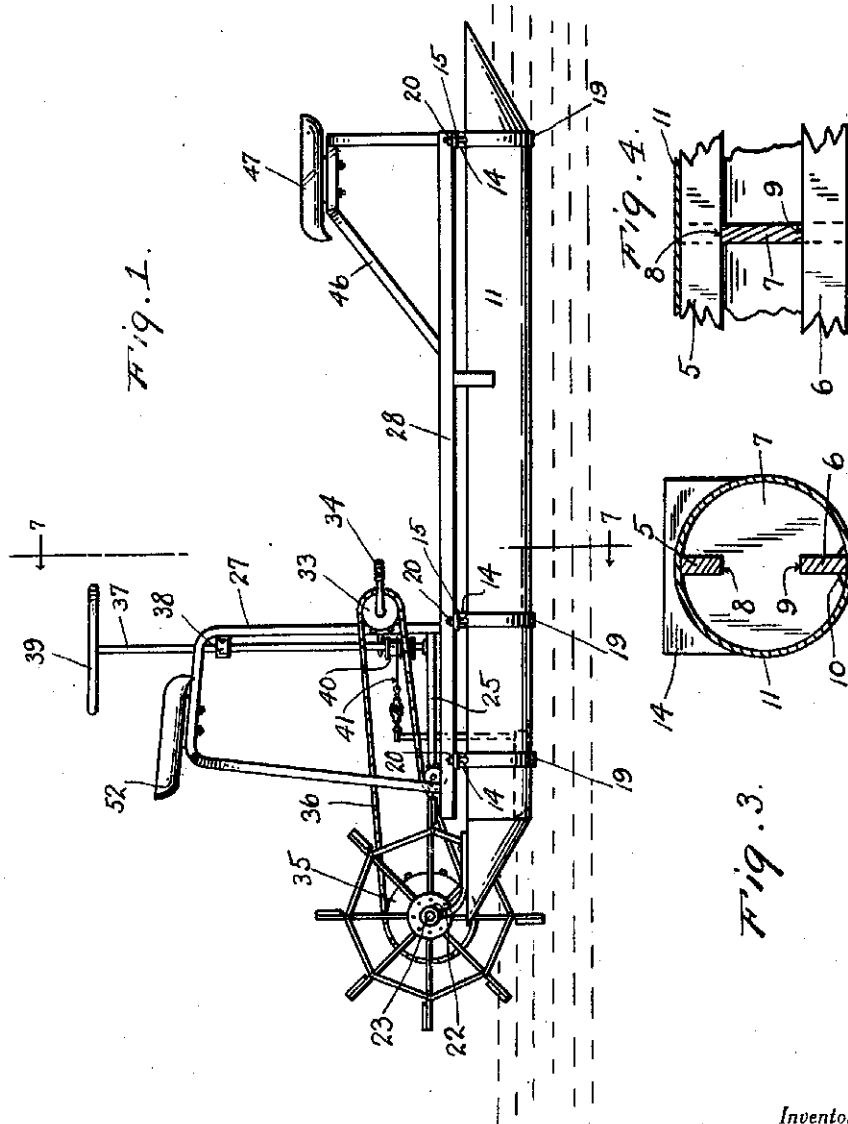
Dec. 17, 1929.

H. CHITTY  
TROLLING RAFT

1,740,002

Filed May 18, 1929

4 Sheets-Sheet 1



Inventor

Howard Chitty

By *Clarence A. O'Brien*  
Attorney

Dec. 17, 1929.

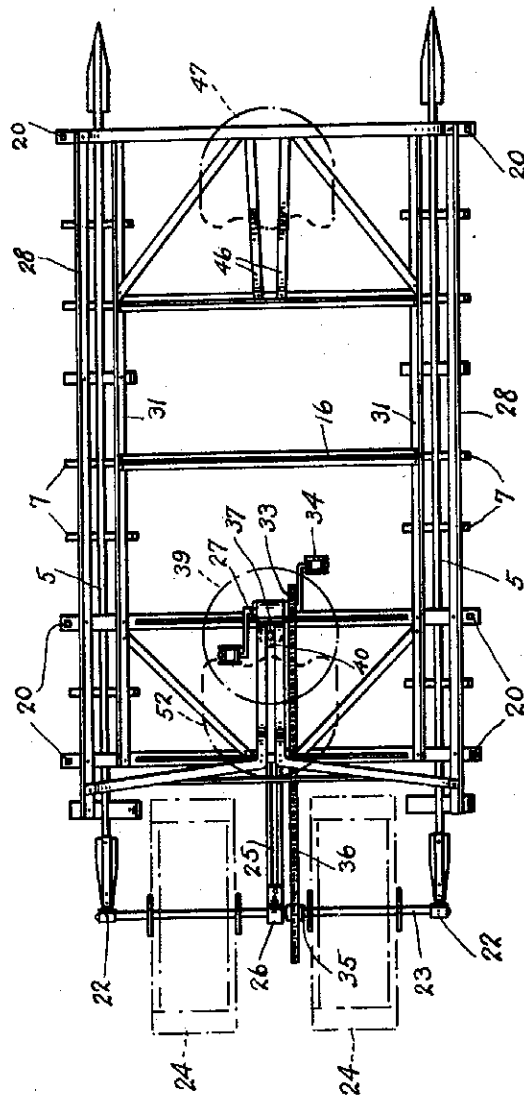
H. CHITTY  
TROLLING RAFT

1,740,002

Filed May 18, 1929

4 Sheets-Sheet 2

Fig. 2.



Inventor

Howard Chitty

By *Clarence A. O'Brien*  
Attorney

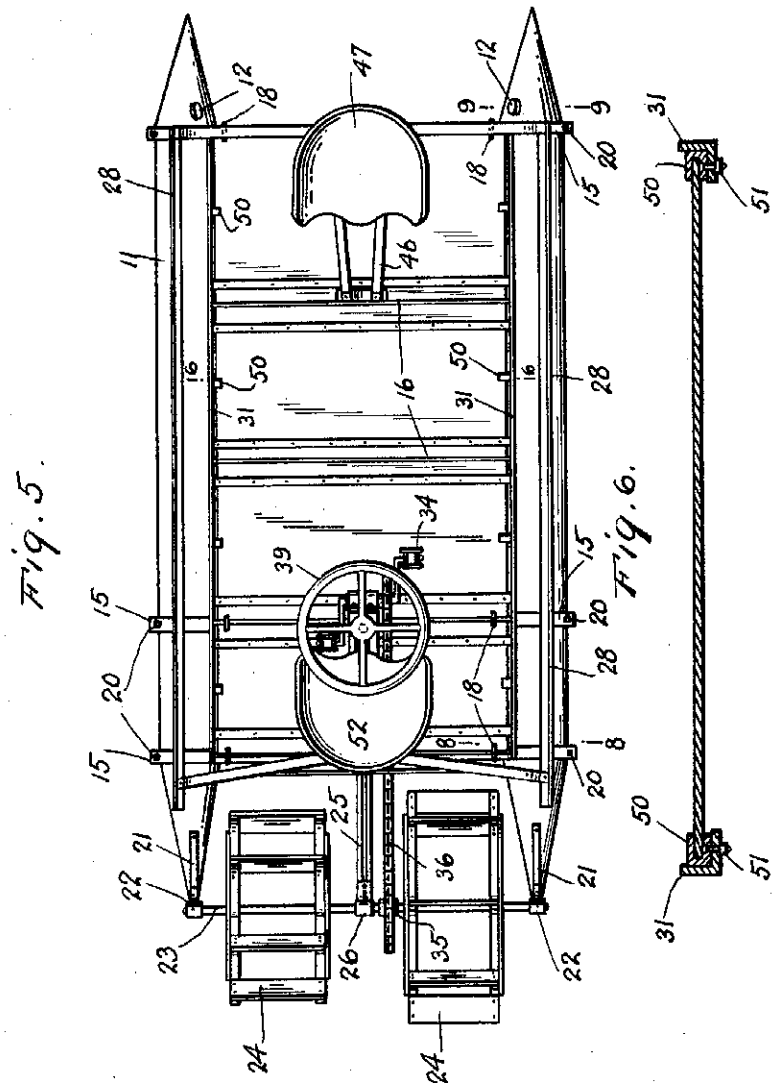
Dec. 17, 1929.

H. CHITTY  
TROLLING RAFT

1,740,002

Filed May 18, 1929

4 Sheets-Sheet 3



Inventor

Howard Chitty

By *Clarence A. O'Brien*  
Attorney



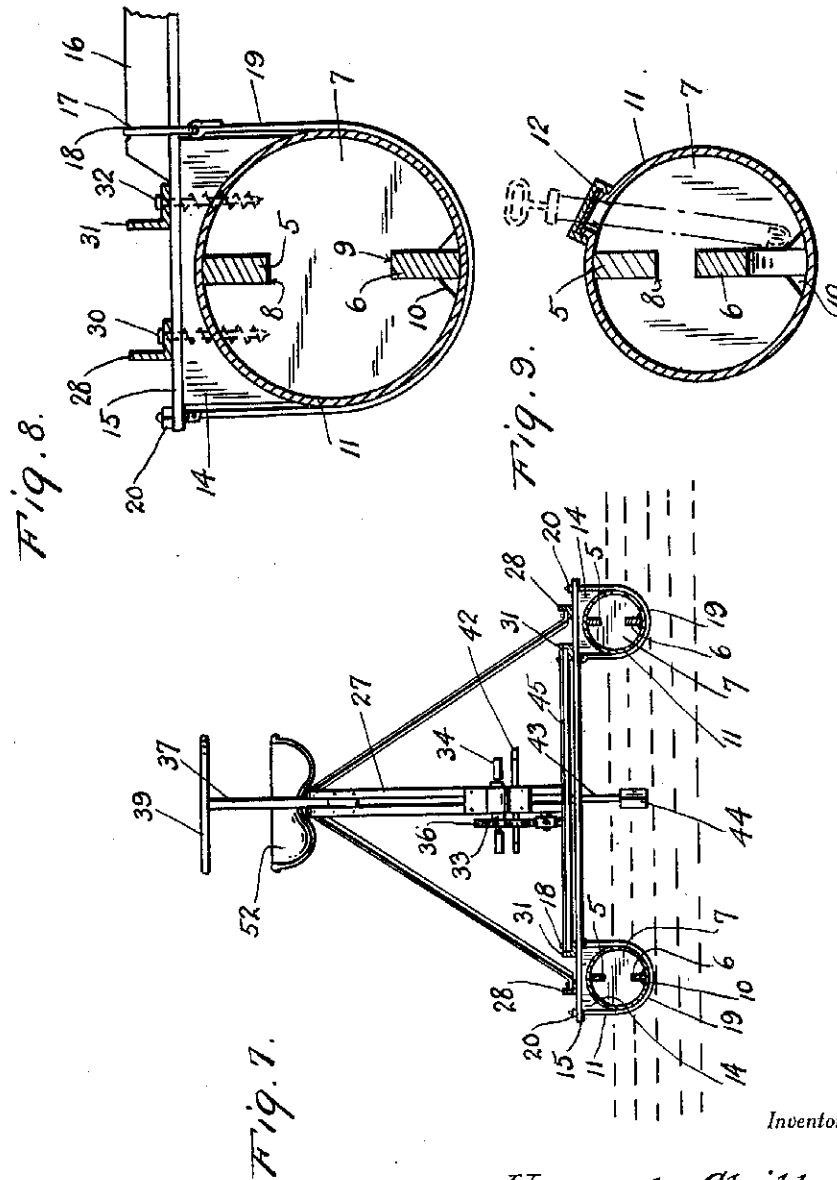
Dec. 17, 1929.

H. CHITTY  
TROLLING RAFT

1,740,002

Filed May 18, 1929

4 Sheets-Sheet 4



Inventor

Howard Chitty

By *Clarence A. O'Brien*  
Attorney

## UNITED STATES PATENT OFFICE

HOWARD CHITTY, OF MITCHELL, INDIANA

## TROLLING RAFT

Application filed May 18, 1929. Serial No. 364,045.

The present invention relates to a trolling raft and has for its prime object to provide a device of this nature which is foot propelled. In troll fishing it is necessary to keep moving slowly at all times, and such States as have law prohibiting fishing with a motor driven boat, there is the common practice to troll fish by rowing a pair of oars but the present structure makes propulsion easier than this common practice and more convenient.

This pontoon fishing raft or boat is also very convenient in bathing, still fishing or long vacation voyages down rivers from source to mouth. If preferable to construct decking on this raft of sufficient length and width to accommodate a small pup tent and cots and being constructed of air tight pontoons or tubes is practically non-sinkable in any ordinary waters, such as rivers and inland lakes. It would also be valuable for use in swamp or shallow water, as it draws practically only a few inches and will travel in very shallow water.

Another very important object of the invention resides in the provision of a trolling raft of this nature which is simple in construction, inexpensive to manufacture, having its parts arranged so as to be easily and quickly assembled and disassembled, and otherwise efficient and reliable in use and operation.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawing:

Figure 1 is a side elevation of the raft embodying the features of my invention,

Figure 2 is a top plan view thereof,

Figure 3 is a detail transverse section through one of the pontoons,

Figure 4 is a fragmentary longitudinal section therethrough,

Figure 5 is a top plan view of the raft showing the propellers and pontoons in place.

Figure 6 is a section taken substantially on the line 6--6 of Figure 5,

Figure 7 is a vertical transverse section taken substantially on the line 7--7 of Figure 1,

Figure 8 is a sectional view taken substantially on the line 8--8 of Figure 5, and

Figure 9 is a sectional view taken substantially on the line 9--9 of Figure 5.

This raft is constructed of two or more pontoons. The pontoons may be made of any length and any diameter desired and may be placed any distance apart. Each pontoon is reinforced with a framework of wood. This reinforcing consists of a ridge board 5 and a base board 6, the ridge board being continuous from the stem to the stern while the base board is shortened the extent of the rake at each end of the pontoon.

A plurality of wooden disks 7 join the ridge board and base board being notched as at 8 and 9 to receive the same and the notch 9 at its bottom is widened as at 10.

The casing 11 of the pontoon is disposed about the frame work and is beveled upwardly at the end to provide the desired rake. At one end the casing is provided with an opening having a cap 12 threaded thereover so that a pump is placed in the opening so that the water in the pontoon may be pumped out, said water reaching the end where the pump is located because of the widened lower end of the notches 9.

The block 14 rests on the pontoon above each disk 7. Cross rods 15 rest on the block and extend between the pontoons. Ribs 16 are formed on the rods 15 and terminate different distances from the ends thereof. In the ends of the ribs are notches 17 in which is seated a ring 18.

U-bolts 19 have ends engaged with the rings and extend under the pontoons and through the extremities of the cross rods 15 and said latter ends are threaded to receive nuts 20.

On the rear end of the pontoon are brackets 21 terminating at their rear ends to bearings 22 to receive a shaft 23 on which is a pair of paddle wheels 24. The center bracket 25 extends rearwardly from the rearmost connecting rod and has a bearing at the rear end 26 fixed to the shaft.

A frame 27 rises from the rear portion of the raft with means afforded on longitudinal angle bars 28 engaged on the end portions of the connecting rod 26 and to the block portions by means of screws 30.

The front ends 27 are secured to one of the intermediate connecting rods 15. Other angle bars 31 are anchored to the ends of the rods 15 and the blocks 14 by screws 32. A sprocket 33 with pedals 34 is journaled on the forward portion of the frame 27 as at 38 and a sprocket 35 is mounted on the shaft 23 and a chain 36 is trained over these sprockets. A vertical shaft 37 is journaled on the frame 27 and has a steering wheel 39 at its upper end and a drum 40 at its lower portion with a cable 41 windable thereabout and having its end connected to the cross rod 42 at the upper end of the shaft 43 of the rudder 44.

The decking plates 45 are mounted between the angle bars 31 and between the cross rods 15. The shaft 43 is journaled through the rearmost deck plate.

A seat 46 rises from the front of the raft to support a seat 47. The decking plates are held in place by grooved blocks 50 as clearly illustrated in Figure 6 and these blocks are anchored to the angle bars 31 as at 51.

From the above detailed description it will be seen that a person on the seat 52 on the frame 37 may propel the raft along with ease and steer the same so that the trolling may be accomplished at the desired speed.

It is thought that the construction, utility and advantages of this invention will now be fully appreciated by those skilled in this art without any more detail description thereof.

The present embodiment of the invention has been disclosed in detail merely for the purposes of exemplification since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:

1. In a raft of the class described, a pair of pontoons, blocks on the pontoons, cross rods resting on said blocks, U-bolts holding said cross rods and the blocks assembled on the pontoons, each pontoon including a tube having a ridge board and a base board extending longitudinally thereof and a plurality of disks with notches to receive the boards, said disks extending transversely of the tubes one under each block.

2. In a raft of the class described, a pair of pontoons, blocks on the pontoons, cross rods resting on said blocks, U-bolts holding said cross rods and the blocks assembled on

the pontoons, each pontoon including a tube having a ridge board and a base board extending longitudinally thereof and a plurality of disks with notches to receive the boards, said disks extending transversely of the tubes one under each block, the lower notches being wider at their lower ends so that the pontoons may be tilted to allow any water therein to drain down at one end, said one end being provided with a capped opening so that a pump may be placed therein.

3. In a raft of the class described, a pair of pontoons, blocks on the pontoons, cross rods resting on said blocks, U-bolts holding said cross rods and the blocks assembled on the pontoons, longitudinal bars on the ends of the cross rods above the pontoons, and decking mounted between the inner longitudinal bars, arms extending rearwardly from the pontoons and terminating in bearings, a shaft journaled in said bearings, paddle wheels on said shaft, a frame rising from the rear cross rods, pedals, chain and sprocket mechanism connecting the pedals with the shaft.

4. In a raft of the class described, a pair of pontoons, blocks on the pontoons, cross rods resting on said blocks, U-bolts holding said cross rods and the blocks assembled on the pontoons, longitudinal bars on the ends of the cross rods above the pontoons, and decking mounted between the inner longitudinal bars, arms extending rearwardly from the pontoons and terminating in bearings, a shaft journaled in said bearings, paddle wheels on said shaft, a frame rising from the rear cross rods, pedals, chain and sprocket mechanism connecting the pedals with the shaft, a rudder having a shaft rising through the decking and journaled therein, a seat supported on the frame, means on the rudder shaft and adjacent the seat for turning said rudder shaft.

In testimony whereof I affix my signature.  
HOWARD CHITTY.

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Oct. 7, 1930.

B. EGUILUZ

1,777,749

SWIMMING APPARATUS

Filed Jan. 11, 1928

2 Sheets-Sheet 1

Fig. 1.

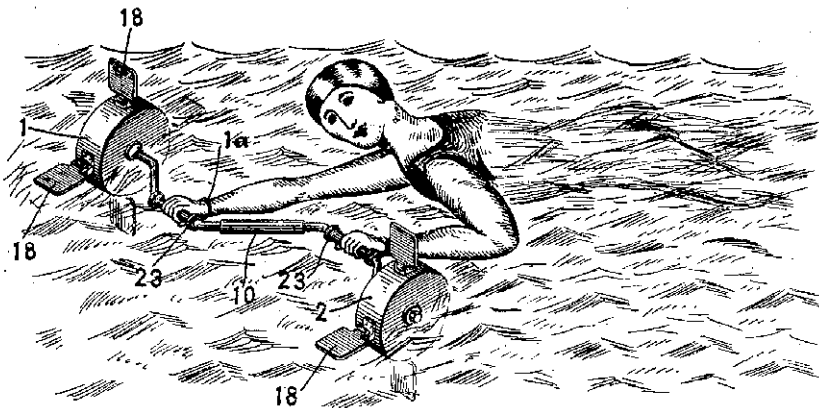


Fig. 2.

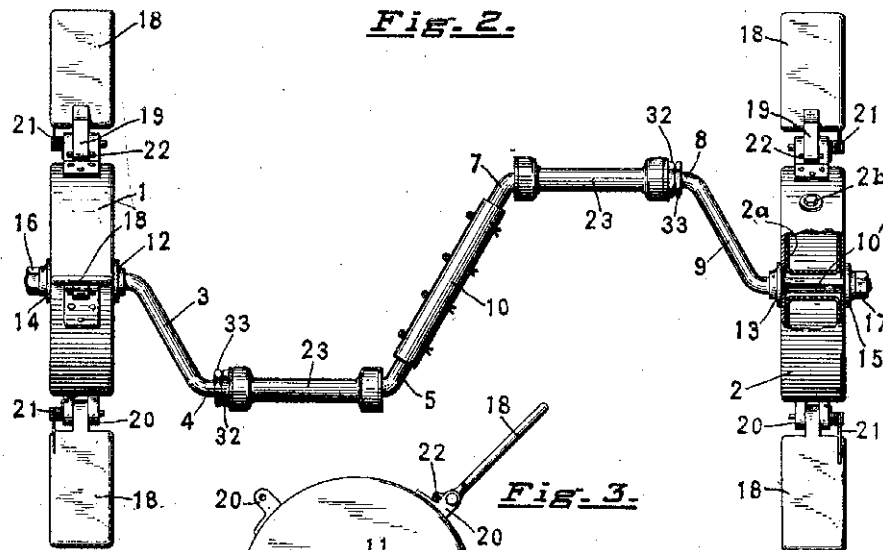
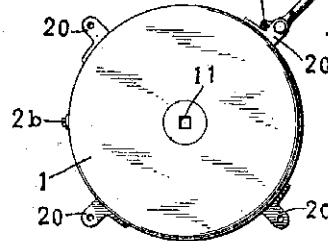


Fig. 3.



INVENTOR.

Benito Eguiluz,

BY

ATTORNEYS.

Oct. 7, 1930,

B. EGUILUZ

1,777,749

SWIMMING APPARATUS

Filed Jan. 11, 1928

2 Sheets-Sheet 2

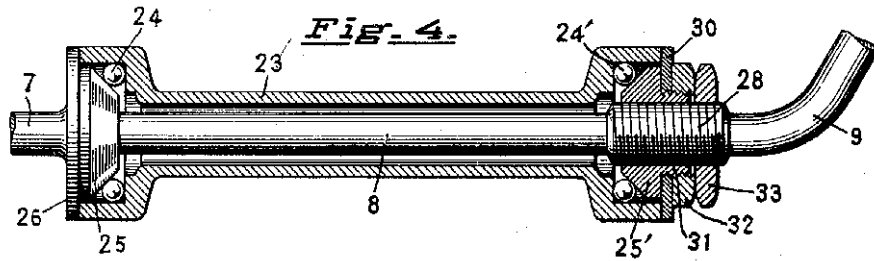


Fig. 5.

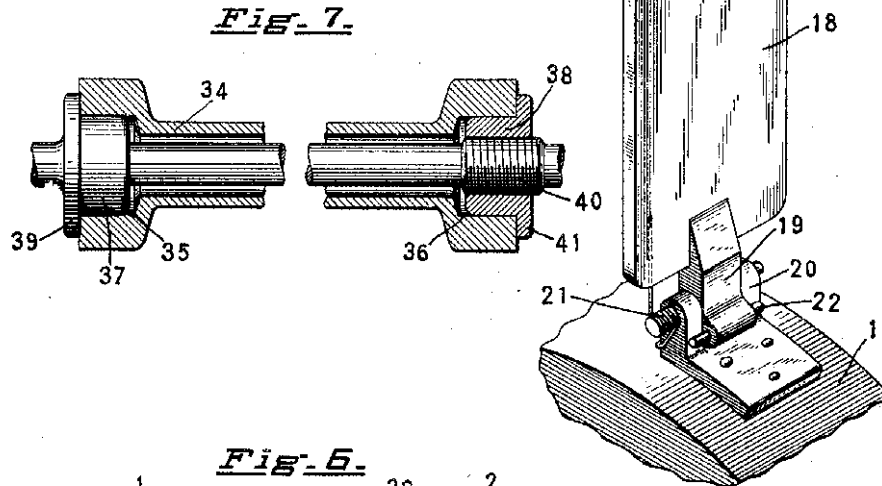
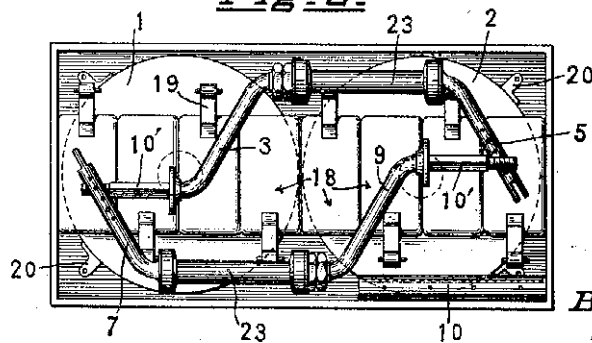


Fig. 6.



INVENTOR.  
**Benito Eguluz,**  
BY *[Signature]*  
ATTORNEY

## UNITED STATES PATENT OFFICE

BENITO EGUILUZ, OF NEW YORK, N. Y.

## SWIMMING APPARATUS

Application filed January 11, 1928. Serial No. 245,887.

This invention relates, as is indicated by its title, to a swimming apparatus. It involves three main elemental members. First, a safety device for swimmers. Second, an exercising device. Third, an instructive device.

It has been a common practice with beginners to employ some type of flotation device for holding the head up and giving confidence. The usual practice is to push a board or log or some other buoyant body ahead of the beginner, but such primitive methods give no immediate arm movement such as is required in the art of swimming. It is one of the objects of the present invention to provide a buoyant body which will give safety and confidence to the user, equal to the primitive device of the plank or other buoyant body. Incidentally, the device, in addition to giving confidence and safety, provides for exercise. Coupled with the exercise, the device gives certain instruction.

It follows that the swimmer using the device even though a novice, gains confidence, exercises the muscles which are necessary in swimming and instructs the swimmer. All of these objects are contained in a very simple and compact structure as hereinafter defined.

Referring to the drawings:

Figure 1, illustrates a device in use.

Figure 2, is a plan view of the device with parts broken away to show construction.

Figure 3, is a detailed side view of one of the buoyant bodies, with a propeller attached.

Figure 4, is a sectional detail of the hand grip and bearing.

Figure 5, is an enlarged view of one of the paddles and its mounting.

Figure 6, illustrates the whole structure in a knock down encased position.

Figure 7, shows a modified form of bearing from that illustrated in Figure 4.

Swimming, as is well known, is largely a matter of confidence and an ability to use the hands and feet for support and propulsion.

Children usually "dog paddle", that is, move the hands rapidly below the head and chest and kick the feet, much after the manner of a frog.

The next step is that of the "breast stroke" where the hands and arms are propelled forward and swung in an arc.

Usually the "side stroke", that is an extension of one arm and a back and down pull on the other holds the head and body up. From this develops the "crawl" and other strokes.

The principal object of the present invention is first to give a feeling of safety and confidence to the swimmers, (if novices), and a means of exercising without great fatigue if more than a novice. In fact, it will permit the novice or the expert to make good time, in so far as propulsion is concerned.

It is possible of regulation for short or long strokes and may be adapted to use in many novel manners.

Referring to the drawings, 1, and 2, indicate buoyant bodies which have a buoyancy sufficient to sustain the weight of an ordinary person with a fair safety factor. These two bodies, 1 and 2, are interconnected by a chain of elements 3, 4, 5, 7, 8, and 9; the three former and three latter being adjustably interconnected through a sleeve 10. Each of the members 5, 7, is perforated as is the sleeve 10. Therefore, the sleeve may occupy an adjusted position on the two members 5, 7, in order to give a longer throw on what is really the crank shaft bearing, the hand grips 4, and 8.

The two elements 3 and 9, have angularly formed ends 10', as illustrated in Figure 2, which pass through openings of similar form 11, in the buoyant members 1, 2.

Collars 12, 13, serve as stops and binding collars 14, 15, with locking nuts 16, 17, complete the juncture between the buoyant members 1, 2, and the crank shaft elements 3, 9.

On each of the buoyant members 1, 2, may be arranged paddle elements 18, which preferably have tail pieces 19, which are pivoted in bifurcated brackets 20, secured to

the outer portion of the buoyant members 1, 2. A light spring 21, tends to normally hold these paddles 18, in fixed position for propulsion, inasmuch as pins 22, extend through the tail pieces 19, and abut against the bifurcated brackets 20.

The effect of this arrangement is that the paddles are rigidly held for propulsion during the forward sweep of the paddles, but permit a free backward movement of the paddle. This arrangement permits the swimmer to give more or less force to either arm stroke and thus permit a directional control.

There is a further purpose in having the paddles pivoted to the brackets of the buoyant members.

Pivots may be readily removed to permit packing the various parts of the device, as is clearly illustrated in Figure 6.

The hand grips 4, 8, illustrated in Figs. 1, 2, and 4, of the drawings are mounted on ball bearings and consist mainly of an outer sleeve or grip member 23, having at each end a ball race 24, 24', within which fit cones 25, 25'. The cone 25, may be backed up by a disk 26, and the adjustment for the bearing may consist of the cone 25', adjustable upon a threaded sleeve or enlargement 28, on the crank element 9.

A threaded disk 30, engages a reduced portion 31, of the cone 25', and is held in proper adjustment by a nut 32, and lock nut 33. Such a hand grip bearing gives great freedom of action between the parts and may be readily filled with a lubricant which is held therein by the collars, disks, etc., thus requiring no attention.

In Figure 7, there is shown a slightly modified form of bearing which does not require the cones and balls and ball races. This structure provides a simple and less expensive form of apparatus.

There is an outer tubular form 34, having interior bearing surfaces 35, 36, which engage bearing hubs 37, 38. The former is just in advance of a closure collar 39, and the latter is threaded to the shaft part 40, and has a closure collar 41.

This particular form and type of bearing for the grip device may be varied to suit the exigencies of any particular requirement, the main thought being that it shall be "fool proof" and active enough to insure continued use without disturbing the operator.

Likewise, the exact form of paddles and attachments may be modified and the character of the buoyant members may be changed.

One suggested change is illustrated in the right hand Figure 2, where the buoyant member 2, has an interlining of rubber or other material 2A, that may be inflated through a valve opening 2B, in order to insure greater safety in the event of the outer casing of the element 2 becoming damaged.

In fact, the entire buoyant member might be an inflatable member.

Whatever the constructional feature or materials, the main purpose of this invention is to provide buoyancy with safety and a means of propulsion.

As an added adjunct to safety, arm or wrist loops 1A are provided to keep the device attached to the arms of the swimmer. This will insure the swimmer having an opportunity of always regaining control of the device, should ever the hand, for any reason, slip from the hand grip.

It is to be presumed that the metallic parts of the hand grip may be covered with a resilient material, if desired.

What I claim as my invention and desire to secure by Letters Patent is:

1. A swimming device comprising a pair of floats, an intermediate crank shaft having two crank arms and means for adjusting the throw of the crank arms relatively to each other to lengthen or shorten the stroke of the swimmer, and hand grips for the swimmer.

2. In a swimming device, a pair of floats, intermediate crank shafts for rotating the floats and paddles pivotally mounted upon the floats and held against relative movement to the float, when moved in one direction.

3. In a swimming device, a pair of floats, means for inflating the floats with air, an intermediate crankshaft having a crank for each hand of the swimmer and paddles apertured to the float.

4. A device of the character described, a pair of separable crankshafts, one for each hand of the swimmer and removably attached floats for each of the crankshafts.

5. A device of the character described, a pair of separable crankshafts, one for each hand of the swimmer, removably attached floats for each of the crankshafts, and removably secured paddles for the floats whereby the various elements described may be assembled or unassembled for packing.

6. In a swimming device, a pair of floats comprising a casing and a separate interior inflatable member and a crankshaft joining the two floats with a crank for each hand of the swimmer.

BENITO EGUILUZ.

Nov. 12, 1946.

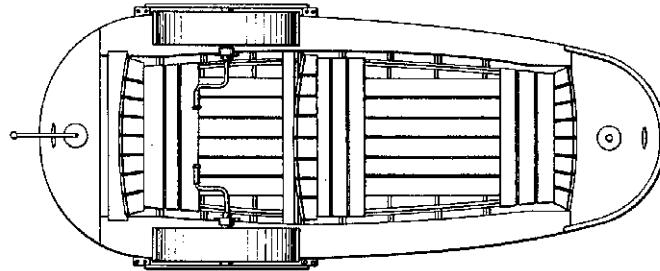
L. CONSIGLIO

Des.145,884

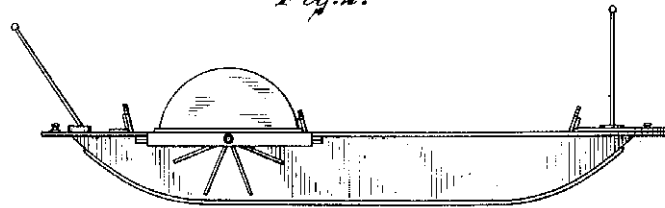
BOAT

Filed Sept. 28, 1945

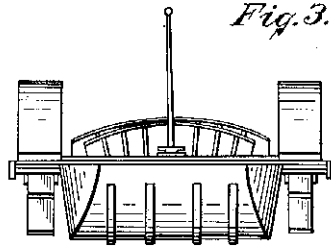
*Fig. 1.*



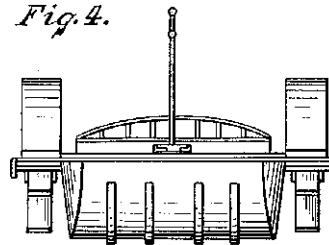
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Inventor

LOUIS CONSIGLIO.

By

*Louis V. Lucia*

Attorney.



Patented Nov. 12, 1946

Des. 145,884

# UNITED STATES PATENT OFFICE

145,884

## DESIGN FOR A BOAT

Louis Consiglio, Springfield, Mass.

Application September 28, 1945, Serial No. 122,387

Term of patent 14 years

(Cl. D71-1)

*To all whom it may concern:*

Be it known that I, Louis Consiglio, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented a new, original, and ornamental Design for a Boat, of which the following is a specification, reference being had to the accompanying drawing, forming part thereof.

Fig. 1 is a top plan view of a boat comprising my new design.

Fig. 2 is a side elevational view thereof.

Fig. 3 is a front elevational view thereof.

Fig. 4 is a rear elevational view thereof.

The side opposite that shown in Fig. 2 is the same as the one illustrated.

I claim:

The ornamental design for a boat, substantially as shown and described.

LOUIS CONSIGLIO.

July 4, 1950

W. C. HEELS ET AL

Des. 159,204

PEDAL OPERATED WATER VEHICLE

Filed Oct. 22, 1948

2 Sheets-Sheet 1

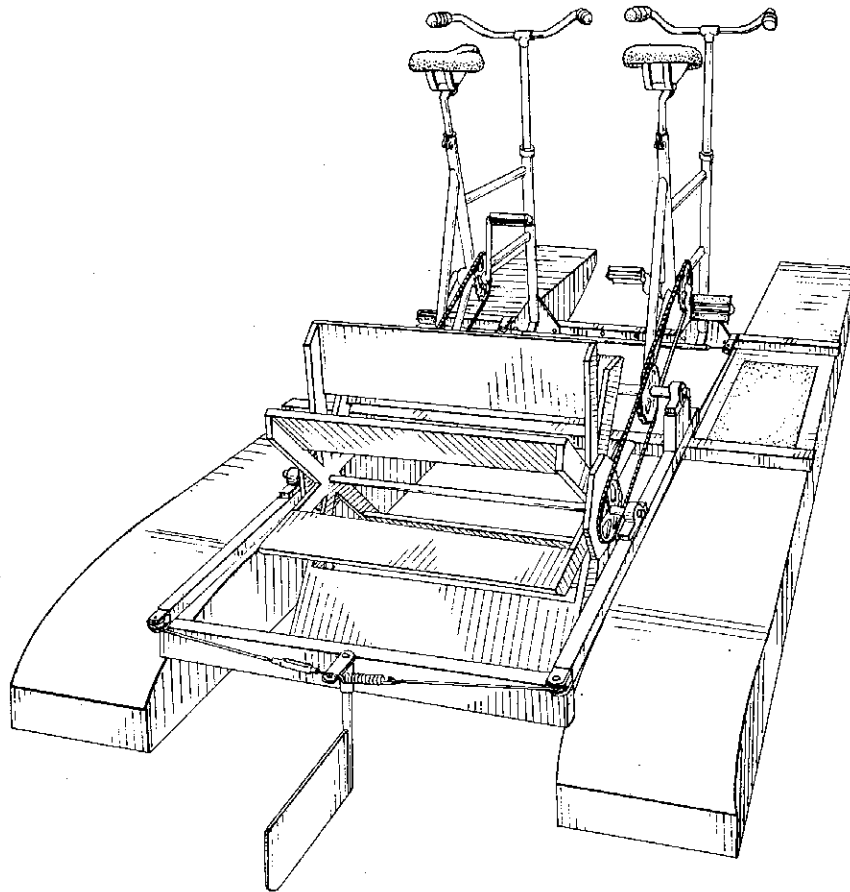


Fig. 1.

INVENTOR.  
William C. Heels & Virgil K. Insko  
BY  
*Stanley Lightfoot*  
ATTORNEY.

July 4, 1950

W. C. HEELS ET AL  
PEDAL OPERATED WATER VEHICLE

Des. 159,204

Filed Oct. 22, 1948

2 Sheets-Sheet 2

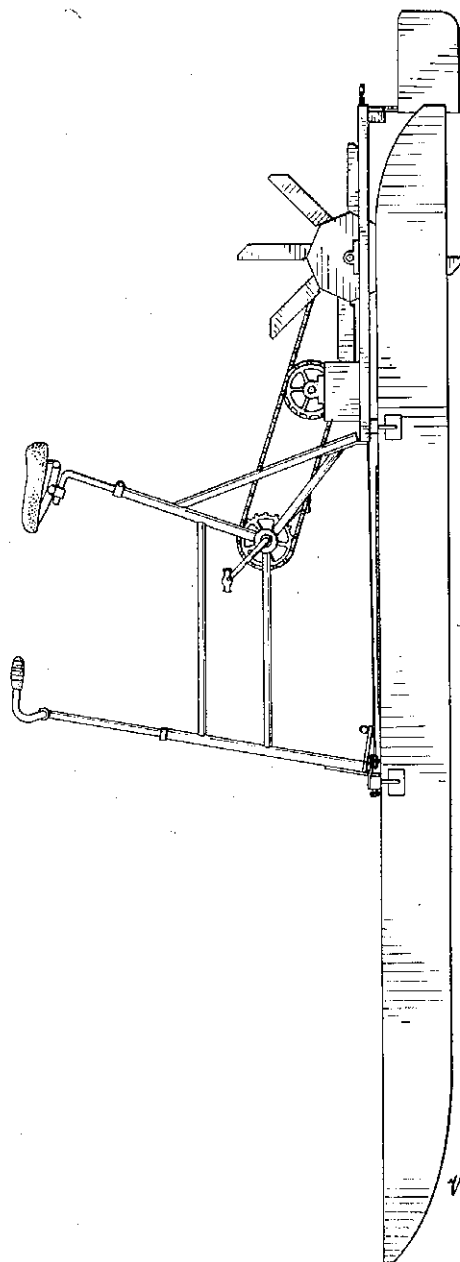


Fig. 2.

INVENTOR  
William C. Heels & Virgil A. Inscho  
BY  
*Stanley Lightfoot*  
ATTORNEY.

Patented July 4, 1950

Des. 159,204

# UNITED STATES PATENT OFFICE

159,204

## PEDAL OPERATED WATER VEHICLE

William C. Heels, Grosse Pointe Farms, and  
Virgil K. Inscho, Detroit, Mich.

Application October 22, 1948, Serial No. 149,234

Term of patent 7 years

(Cl. D71-1)

*To all whom it may concern:*

Be it known that we, (a) William C. Heels and (b) Virgil K. Inscho, citizens of the United States, residing at (a) Grosse Pointe Farms and (b) Detroit, in the county of Wayne and State of Michigan, have invented a new, original, and ornamental Design for a Pedal Operated Water Vehicle, of which the following is a specification, reference being had to the accompanying drawing, forming part thereof.

In the drawings:

Figure 1 is a perspective view of a pedal operated water vehicle showing our new design.

Figure 2 is a side elevation of the same.

We claim:

The ornamental design for a pedal operated water vehicle, as shown.

WILLIAM C. HEELS.  
VIRGIL K. INSCHO.

## REFERENCES CITED

The following references are of record in the file of this patent:

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D. 151,332	Melton	Oct. 12, 1948
691,805	Perry	Jan. 28, 1902
2,263,911	Wilson	Nov. 25, 1941
2,287,706	Perry	June 23, 1942



April 3, 1962

C. D. TOWN

3,027,863

FEATHERED PADDLE-TYPE PROPULSION MECHANISM

Filed June 22, 1959

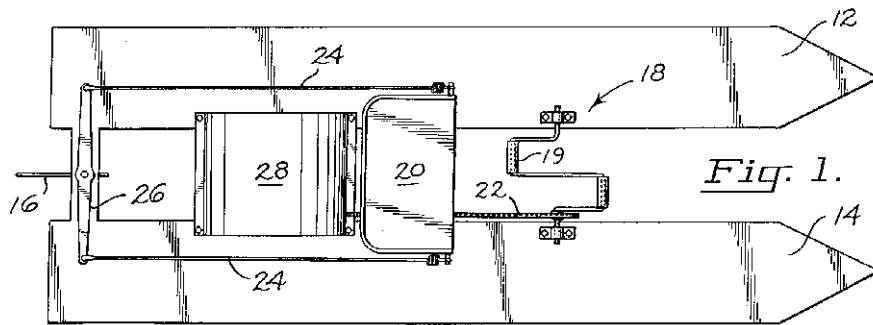


Fig. 1.

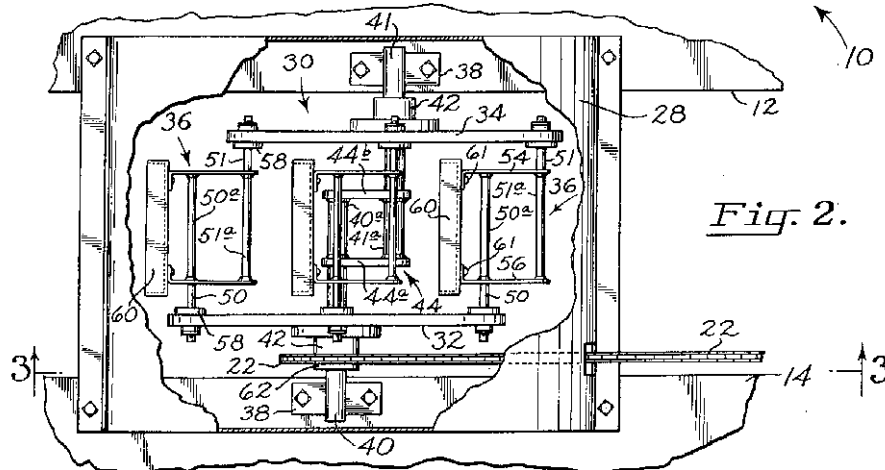


Fig. 2.

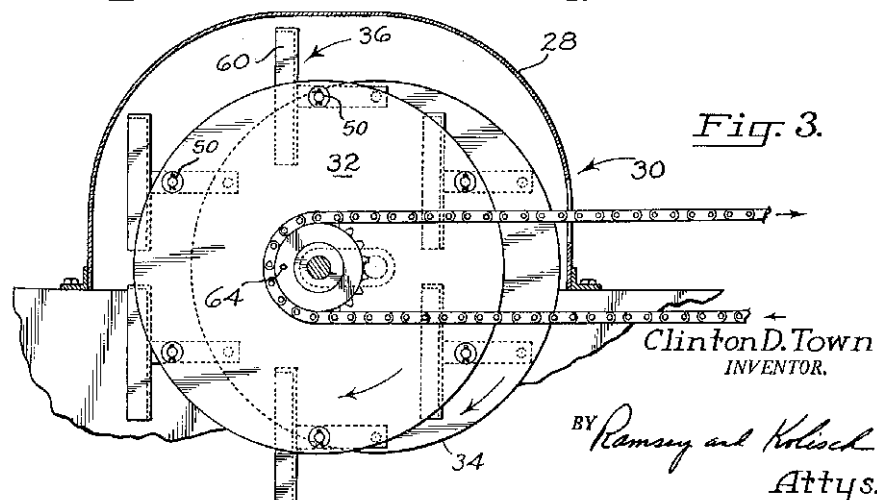


Fig. 3.

Clinton D. Town  
INVENTOR.

BY *Ramsay and Kolisch*  
Attys.

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3,927,863

## FEATHERED PADDLE-TYPE PROPULSION MECHANISM

Clinton D. Town, 5365 SE. Bush St., Portland, Oreg.  
Filed June 22, 1959, Ser. No. 822,077  
4 Claims. (Cl. 115—26)

This invention relates to a propeller or propulsion mechanism for a boat, and more particularly to an improved construction for such a mechanism that employs upstanding paddles that are feathered as they move in and out of the water. Mechanism of this general description is disclosed in an application of applicant entitled "Boat and Propeller Mechanism," Serial No. 745,529, filed June 30, 1958, now Patent 2,918,892.

As discussed in the earlier application, a form of construction for a paddle-type propeller mechanism comprises a pair of laterally offset crank members that are rotatable about parallel but radially offset rotation axes, one of the crank members ordinarily being located forwardly of the other. Paddles for the propulsion mechanism are mounted intermediate the crank members, and means is provided connecting each of the paddles to each of the crank members. When the two crank members are rotated, the paddles move in substantially circular course that extends about a phantom axis parallel to the rotation axes of the crank members. By proper placement of the rotation axes of the crank members, a construction is possible wherein a multiple number of paddles, considerably in excess of three, may be mounted between the crank members with all the paddles moving in a common circular path. The result is smooth propulsion of a boat, since veering tendencies are not introduced and at any given time one or more paddles is positioned in the water.

In such a construction, because of the offset of the rotation axes of the crank members, stresses are set up that, if not properly taken care of, tend to twist the paddles in their mountings and to perform the crank members. This is particularly troublesome if the paddle mechanism is driven at high speeds. While bending and twisting of the parts could be taken care of by increasing their mass and size, this expedient adds weight and considerable expense. In this connection, it should be brought out that the propulsion mechanism is ideally suited for small sporting and pleasure boats, and high speed is a decided disadvantage.

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the bar portions and their rigid connection with the axles resists skewing of these inner axle ends. The paddles are mounted intermediate the disc crank members, each on a pair of paddle spindles having overlapping ends disposed in the space between the disc members, and these also are fixed together by spaced bar members. These latter bar members continue from the spindles to join with opposite sides of a paddle. Since the paddles are feathered, it is necessary, with the spindles fixed together, that the spindles be rotatably mounted in the respective crank members. Through the use of the overlapping paddle spindles and overlapping dead axles, a rigid, thoroughly interbraced structure is possible that is ideally suited to withstand the stresses and strains to which such paddle mechanisms ordinarily is subjected.

Thus it is a more specific object of the invention to provide a propeller mechanism employing offset rotation axes for a pair of laterally spaced crank members, wherein the crank members are mounted on dead axles, and wherein these axles project into the space between the crank members and are interconnected in this space by means preventing skewing of the axles relative to each other.

Another object is to provide such a construction where the axles are dead axles and have inner ends that overlap and where the overlapping ends are held from skewing with bar portions spaced axially on the dead axles and fixed thereto.

Another more specific object is to provide improved mounting for the paddles of such a propulsion mechanism that comprises a pair of substantially parallel paddle spindles with overlapping ends fixed together, said spindles having opposite ends rotatably mounted in the crank members.

A related object is to provide a mounting for the paddles wherein the paddle spindles are fixed together by means of rigid strengtheners spaced axially on the spindles.

The invention is characterized by other objects, features and advantages, and is described hereinbelow in conjunction with the accompanying drawings, wherein

FIG. 1 is a plan view of a catamaran boat such as may be provided with the propulsion mechanism of this invention, and showing the general location of the propulsion mechanism;

FIG. 2 is a view of rear portions of the boat in FIG. 1, slightly enlarged and with portions of boat structure

invention, such boats having a conventional single hull or a hull with a forked end for mounting the mechanism. The particular type of boat forms no part of the invention.

With reference now to FIGS. 2 and 3, hood 28 covers a propulsion or propeller mechanism, indicated generally at 30. This comprises a pair of rotatable disc crank members 32, 34, laterally spaced from each other, and plural paddle means indicated at 36, disposed in the space between the crank members and mounted so that on rotation of the members the paddles move in and out of the water and also are feathered.

More specifically, secured to hulls 12 and 14 on either side of mechanism 30 are a pair of brackets or mounting plates 38. Affixed to these mounting plates and extending inwardly therefrom are dead axles 40, 41. Rotatably mounted on these axles, by bearings 42, are disc crank members 32, 34, and these are mounted intermediate the axle ends. Thus the dead axles project into the space between the crank members, and have a set of ends, designated 40a and 41a, that are adjacent.

The axles 40, 41 are maintained in parallel alignment and prevented from skewing by strengthening or stabilizing means indicated at 44 comprising bar portions 44a and 44b spaced axially on the axles and set parallel to one another. Bar portions 44a, 44b extend perpendicularly between the overlapped portions of the axles and are rigidly fixed as by welding at opposite ends to each of the axles. Thus a rectangular skeleton is framed. The bars function as compression and tension members when stresses are exerted by the axle ends tending to cause their deformation. It should be noted that through the use of dead axles the connections of the bars with the axles may be fixed ones.

While axles 40, 41 mount the centers of the offset disc crank members, the lateral spacing of peripheries of the disc crank members is maintained by means of paddle spindles 50, 51, forming part of the paddle means 36. The paddle spindles are radially offset and parallel to one another, and have overlapped inner ends 50a, 51a in the space between the crank members. As in the case of the axles, the paddle spindles are secured and maintained in parallelism through bar portions spaced axially on the spindles, these being designated at 54, 56. The bar portions extend normally of the spindles and have opposite end portions fixed to the paddle spindles as by welding. The outer ends of the spindles are rotatably mounted in the crank members to enable pivotal movement of the bar portions 54, 56 relative to the disc crank members on rotation of the crank members. Thus the ends are journaled in bearings 58 of the crank members.

Each paddle means 36 also includes an upright paddle portion 60. These are secured to bar portions 54, 56 as by connections 61. The connections of the bar portions with the paddle portions are at opposite sides of the paddle portions, and this contributes to inhibiting twisting of the paddle when it is drawn through the water.

The propulsion mechanism receives its drive from drive chain 22 through a sprocket 62 secured to crank member 32. Sprocket 62 constitutes means connected to a crank member for rotating the propulsion mechanism.

It will be noted with special reference to FIG. 3 that the journaled ends of the paddle spindles are disposed at regular angular modules about the rotation axes of the crank members. The various paddles are disposed in a circle about a phantom axis extending parallel to the rotation axes of the crank members, and indicated in FIG. 3 for the embodiment shown generally at 64. On rotation of the crank members, the orbits described by the various bearings or mountings for the paddle spindles on one crank member overlap with the orbits described by the bearings or mountings for the paddle spindles on the other crank member. As a result, three or more paddles may be mounted for movement in a common path without the paddles coming in the way of each other, as discussed

in the application having Serial No. 745,529, referred to above.

The construction described herein has the advantage of enabling firm holding of the various paddles in proper position during their movement through the water. There is a minimum amount of distortion in the members due to stresses imposed thereon. The components of the propeller mechanism may be produced inexpensively from ordinary materials.

It is claimed and desired to secure by Letters Patent:

1. In propulsion mechanism for a boat having a pair of laterally spaced apart and rotatable crank members and paddle members intermediate the crank members connected to each, a dead axle mounting each crank member with the crank member rotatable thereon, said axles extending parallel to one another and having a set of ends disposed between the crank members that are adjacent each other, means mounting the axles on the boat at locations spaced outwardly of said crank members, means intermediate the crank members fixing together the adjacent set of axle ends, and drive means connected to at least one of said crank members for rotating the propulsion mechanism.

2. In propulsion mechanism for a boat having a pair of laterally spaced and rotatable crank members and paddle means intermediate the crank members connected to each, a dead axle mounting each crank member with the crank member rotatable thereon, said axles extending parallel to one another and having a set of ends disposed between the crank members, portions of said axles adjacent said set of ends overlapping, means mounting the axles on the boat at locations spaced outwardly of said crank members, and a pair of strengthener bars set substantially parallel to one another, each affixed adjacent each end to an axle, joining together the overlapping portions of the axles.

3. In a boat, a hull, a pair of rotatable crank members set laterally apart from each other with a space therebetween and mounted on said hull, said crank members rotating about parallel and radially offset rotation axes extending transversely of the hull, plural paddle means intermediate the crank members constructed to propel the boat on rotation of the members, and means connecting each paddle means to each of said crank members whereby the paddle means is feathered on rotation of said crank members, the means connecting each paddle means comprising a pair of elongated and parallel but radially offset paddle spindles having one set of ends in the space between the crank members and overlapping portions adjacent said one set of ends, the ends opposite said one set of ends being carried by said crank members, one by each of said crank members, means rotatably mounting said opposite set of ends in said crank members whereby they may rotate relative to the crank members on rotation of the crank members, and rigid means fixed and immovable with respect to the paddle means and both of said paddle spindles at the overlapping portions thereof forming a rigid connection between the paddle means and the paddle spindles.

4. In a boat, a hull, a pair of rotatable crank members set laterally apart with a space therebetween and mounted on said hull, said crank members rotating about parallel and radially offset rotation axes extending transversely of the hull, plural paddle means intermediate the crank members constructed to propel the boat on rotation of the crank members, and means connecting each paddle means to each of said crank members whereby the paddle means is feathered on rotation of said crank members, the means connecting each paddle means comprising a pair of elongated and parallel paddle spindles having one set of ends disposed in the space between the crank members and overlapping portions adjacent this one set of ends, the ends opposite said one set of ends being carried by said crank members, one by each of said crank members, means rotatably mounting said opposite

set of ends on said crank members whereby they may rotate relative to the crank members on rotation of the crank members, and means fixing each paddle means to said pair of paddle spindles, the latter means comprising a pair of spaced bar portions, each of which is rigidly





