(No Model.) 2 Sheets—Sheet 1.

G. A. NEWSAM & J. HAYES.

Marine Velocipede.

No. 241,698. **Patented May 17, 1881.**

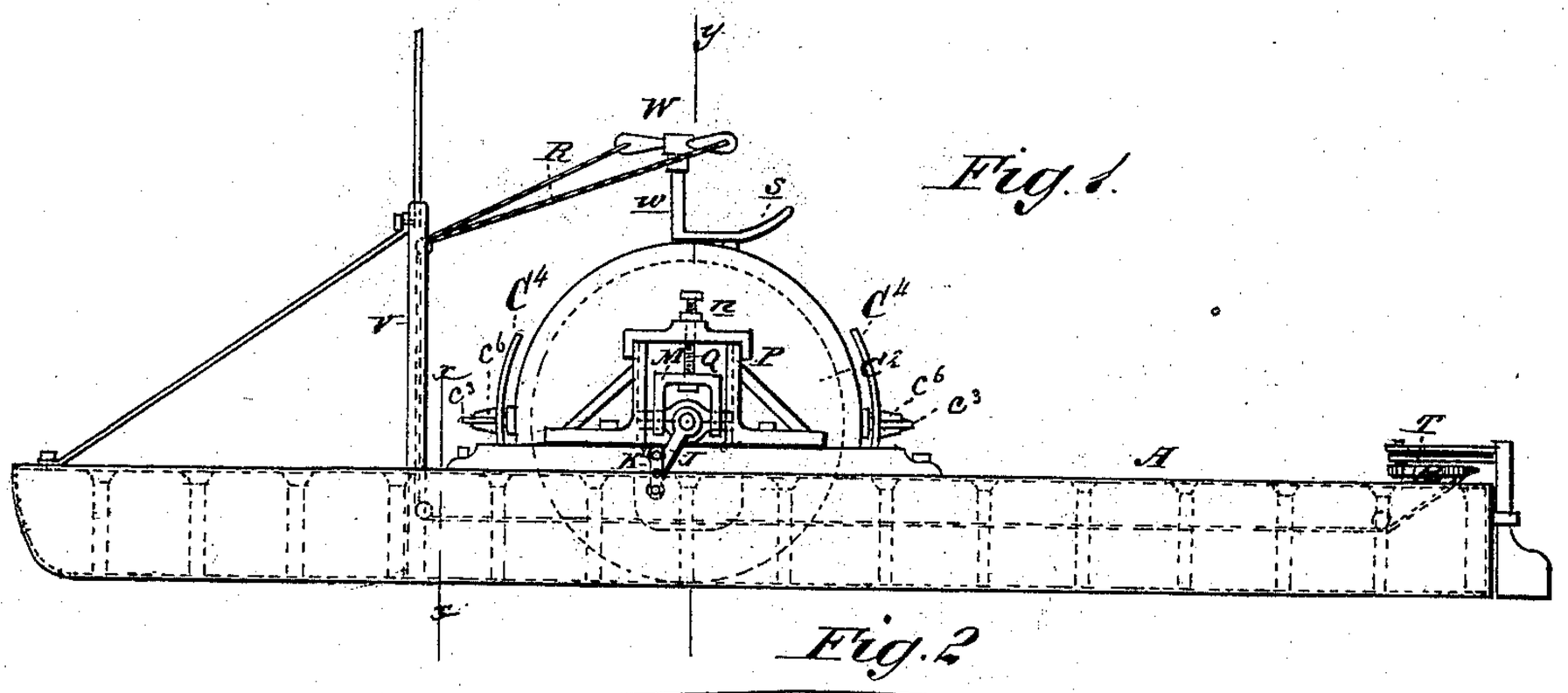


Fig. 1.

Fig. 2

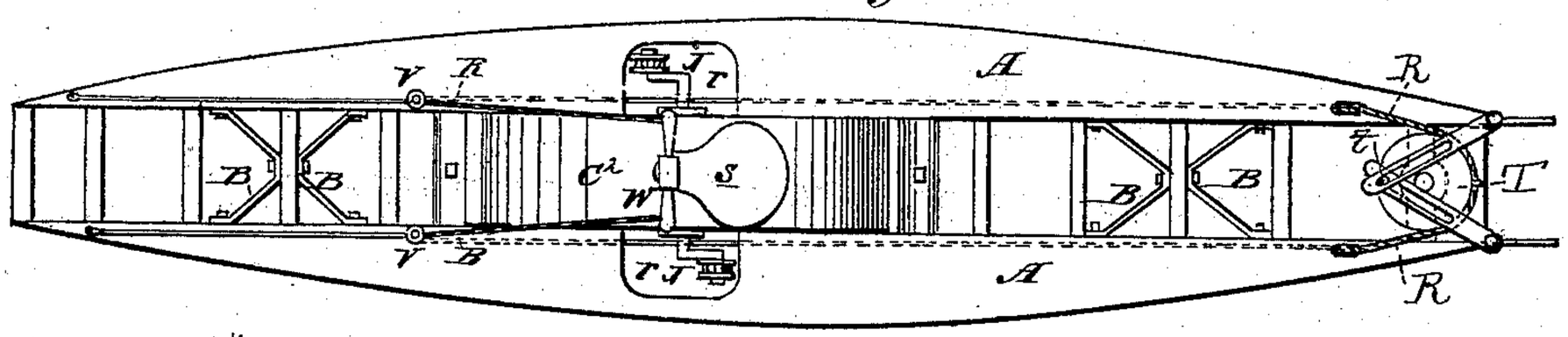


Fig. 3.

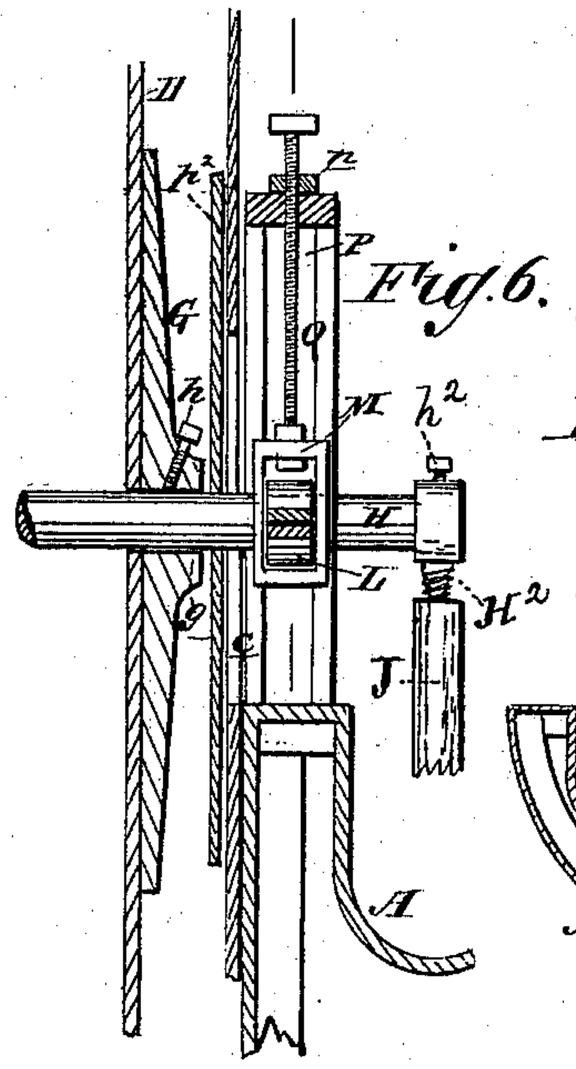


Fig. 6.

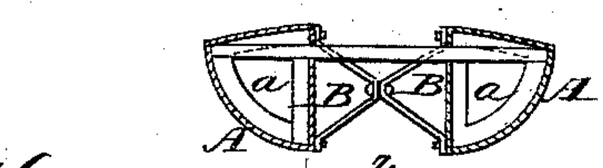
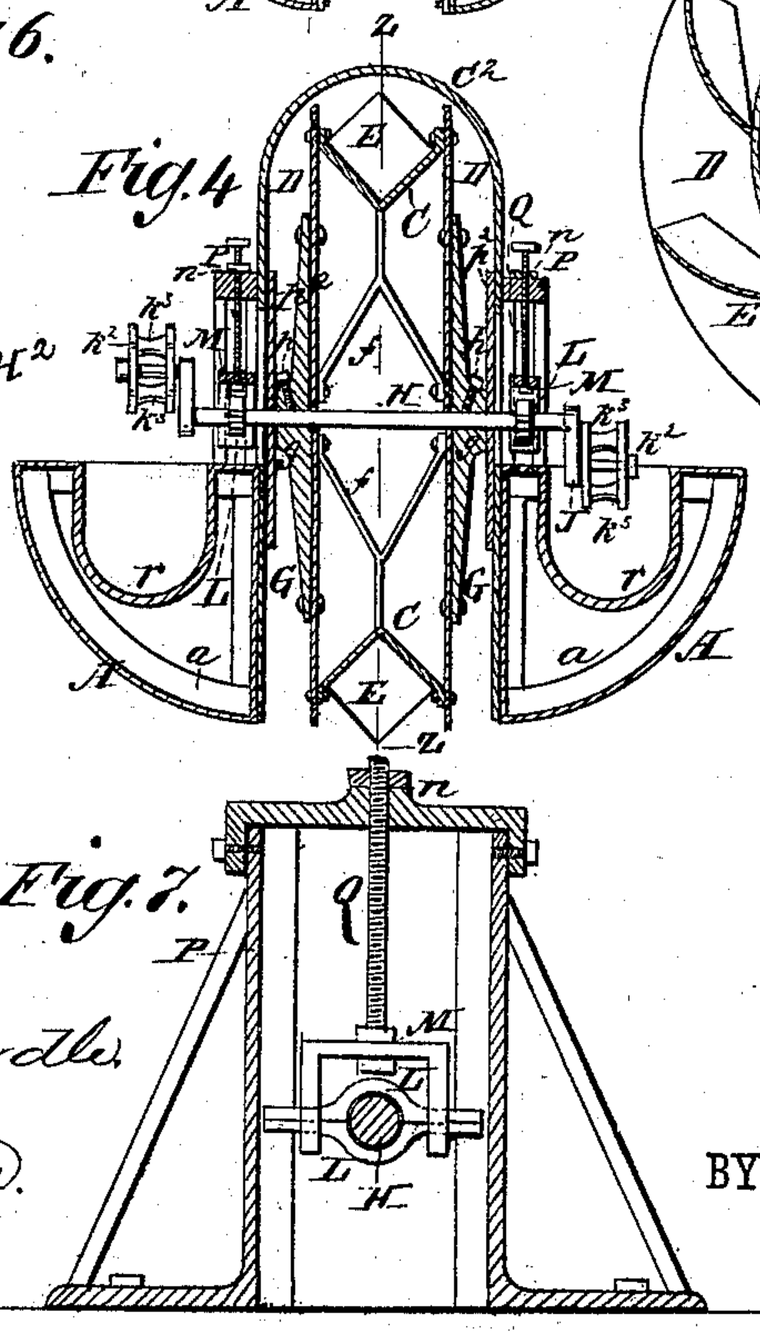


Fig. 4



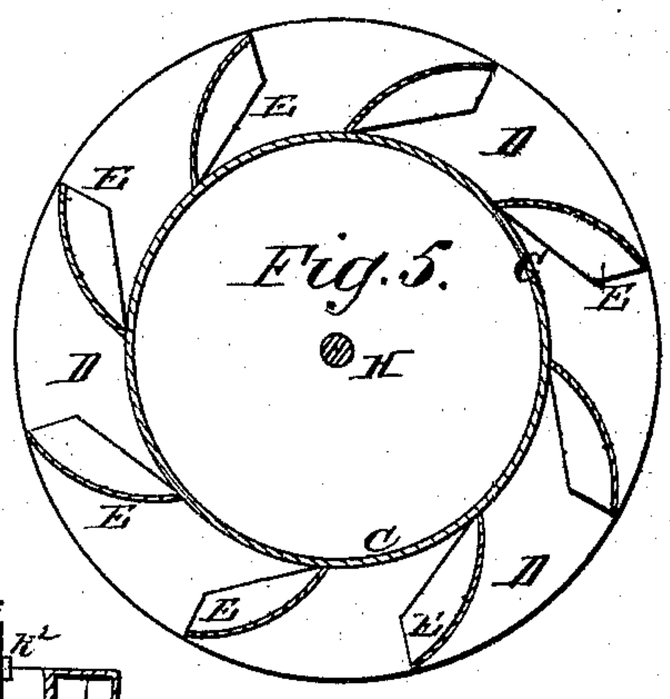


Fig. 5.

Fig. 7.

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(No Model.) 2 Sheets—Sheet 2

G. A. NEWSAM & J. HAYES.

Marine Velocipede.

No. 241,698. Patented May 17, 1881.

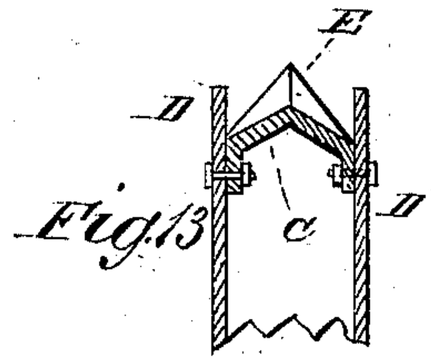

Fig. 13

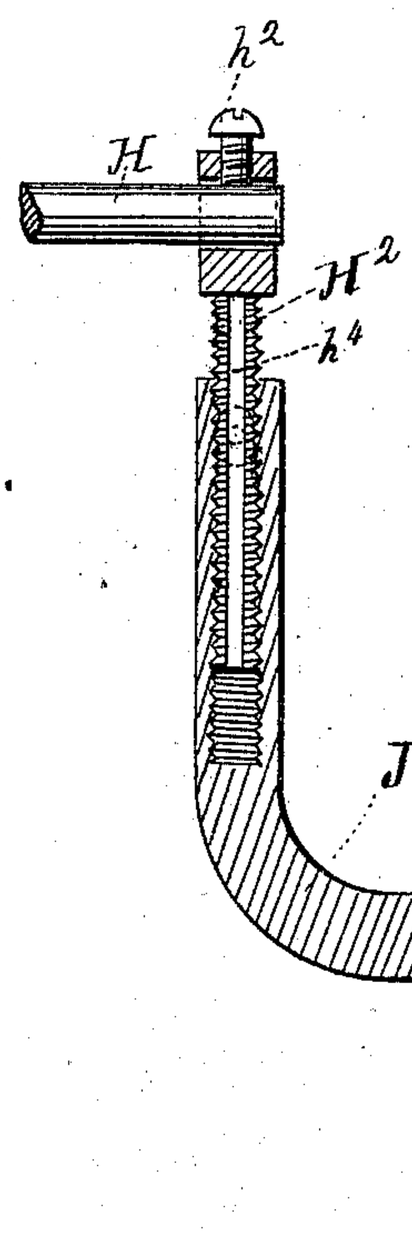

Fig. 8

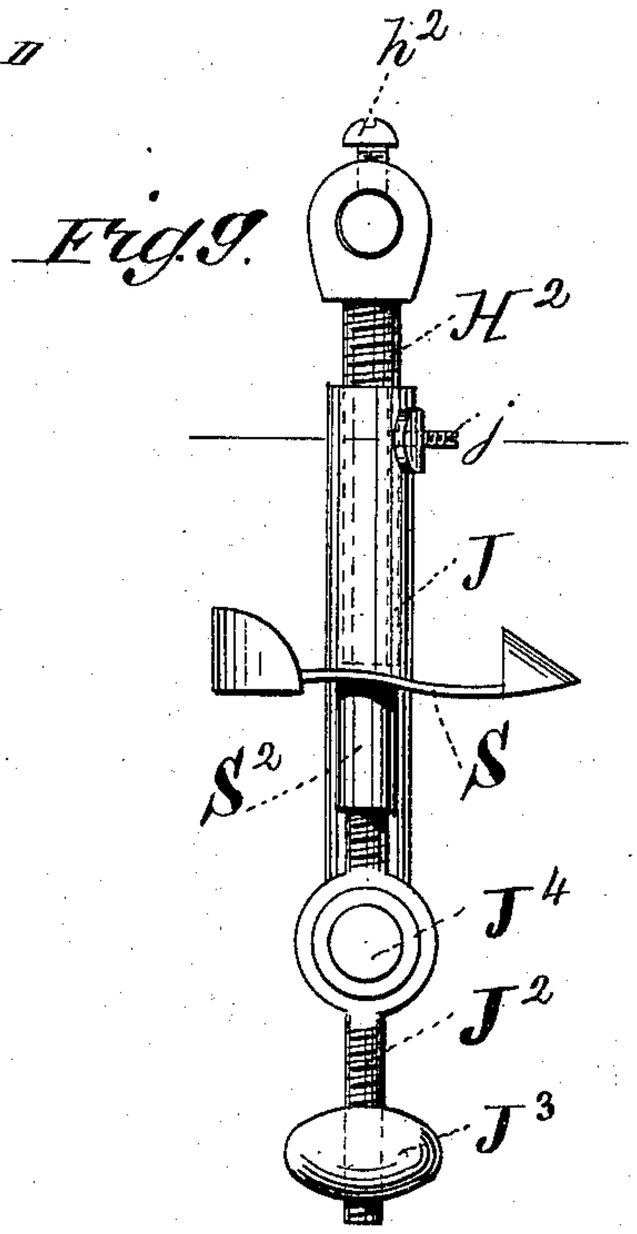

Fig. 9.

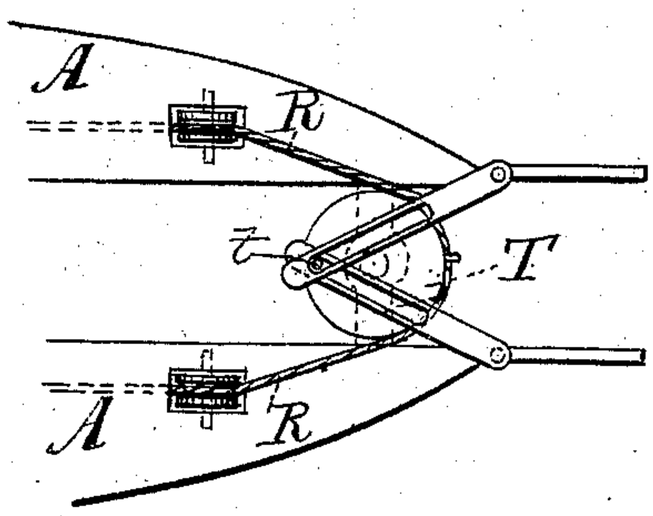

Fig. 11

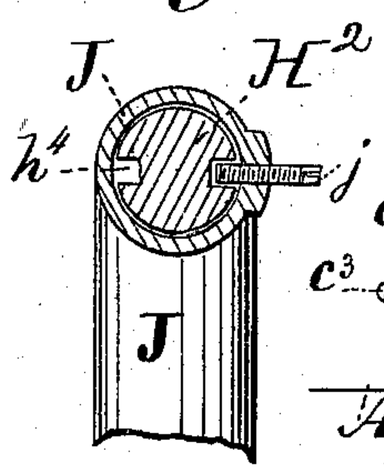

Fig. 10

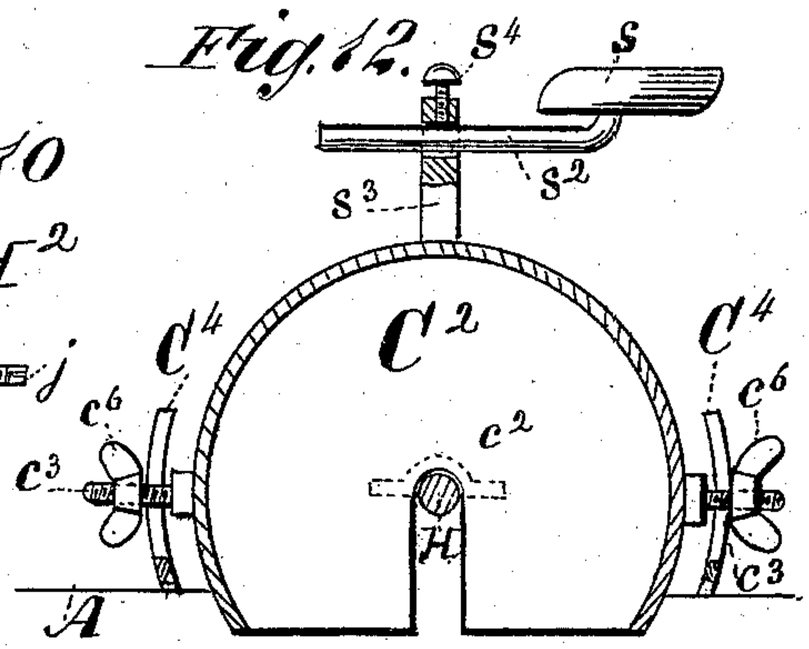

Fig. 12.

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UNITED STATES PATENT OFFICE.

GEORGE A. NEWSAM AND JOHN HAYES, OF BROOKLYN, NEW YORK.

MARINE VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 241,698, dated May 17, 1881.

Application filed October 19, 1880. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. NEWSAM and JOHN HAYES, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Water-Velocipedes; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to the application of the paddle-wheel and the velocipede to a boat constructed in the form known as the "catamaran."

The invention consists in certain novel details of construction of the hulls, the paddle-wheel, and devices connected therewith, whereby certain advantages are obtained, as hereinafter particularly described.

In the accompanying drawings, Figure 1 is a side view of an apparatus embodying our improvements. Fig. 2 is a top view of the same. Fig. 3 is a transverse vertical section taken in the line *x x* of Fig. 1. Fig. 4 is a transverse vertical section taken in the line *y y* of Fig. 1. Fig. 5 is a detail sectional view of the paddle-wheel, taken in the line *z z* of Fig. 4. Figs. 6 and 7 are detail sectional views of an apparatus for raising and lowering the shaft of the paddle-wheel, as hereinafter referred to. Figs. 8, 9, and 10 are detail views of the crank and foot-piece. Fig. 11 is a detail view of the steering apparatus. Fig. 12 is a detail view of the cap or wheel-house and the seat. Fig. 13 is a detail sectional view of a portion of the paddle-wheel.

In catamarans as usually constructed each hull is of a double conical or cigar shape, so that a cross-section amidships will describe a circle. In our invention each hull is of a form corresponding longitudinally with one-quarter of the shape referred to, so that a cross-section amidships will describe a quadrant. By this construction we obtain a vertical and rectilineal inner surface and a horizontal top surface for each hull. By the vertical and rectilineal inner surface we provide for less resistance of the water, and by the horizontal upper surface we facilitate the attachment of a deck when desired.

The hull may be constructed of wood, metal, paper, or any other suitable material, and may be strengthened by knees of any suitable description, and the two hulls may be connected and braced in any suitable manner.

In the drawings, A A represent the two hulls, each of which is strengthened by knees *a*, said hulls being quadrantal in their cross-section, and the knees being of corresponding form. The two hulls A A are connected together and braced by means of V-shaped braces B, which may be arranged either vertically, horizontally, or diagonally, as may be preferred. The ends of the V-shaped braces are attached, by rivets or bolts, to the vertical inner sides of the hulls A A, and the apex of each brace abuts against the apex of the contiguous brace, to which it is secured by bolting or riveting. There may be any suitable number of these braces employed. The tops of the hulls A A are strengthened by braces running horizontally from one gunwale to the other, and they may be either left open or decked over, as may be desired.

When the boat is to be used as a pleasure-boat for one person only, the tops of the hulls may be left open; but when it is to be used for carrying one or more persons besides the operator, or for transporting freight or baggage the hulls and the space between them may be decked over, and provision may be made for seats or for storing freight or baggage.

The paddle-wheel is arranged amidships and between the two hulls. This wheel consists of a hollow drum provided with paddles of a peculiar construction. The drum is composed of a band, C, and two ends or sides, D D, which are preferably of sheet metal, bolted or riveted together and soldered in order to render it water-tight. The paddles E are each composed of two pieces. Each piece is of a triangular form, resembling somewhat more than a quarter of an ellipse, two of the sides of the triangle being straight lines and forming an obtuse angle, and the third side being a curved line connecting the extremities of the straight lines, as shown in Fig. 5. These two pieces are secured together at either their curved or their obtuse-angled edges, so as to form a concave paddle V-shaped in its cross-section. The band C of the drum is V-shaped on its periphery, and may be either concave, as shown in Fig. 4, or convex, as shown in Fig. 13, and the ends or

sides D D extend beyond the edges of said periphery.

By constructing the band C in the manner described it provides an arched-shaped connection between the sides D D, and renders the structure exceedingly substantial and effective in use, and thereby possesses advantages over a perfectly cylindrical band.

The paddle E is attached to the drum so that the narrowest portion of the paddle joins the periphery of the drum, and so that the longest of the two straight edges of each piece of the paddle is tangential to said periphery, and the paddle is secured in place by bolting it to the sides or ends D D.

By making the drum hollow and water-tight the buoyancy of the boat is increased when said drum is low enough to rest on the water; but it may be raised above the water when desired, as hereinafter described.

By the shape and arrangement of the paddles, as above described, greater width of paddle is obtained, and less water is lifted than if the paddles were straight; and, moreover, the peculiar shape of the paddle and of the band C has a tendency to compress the water and thus increase the force of each stroke, and this advantage is further enhanced by extending the sides D D beyond the band C.

The drum may be braced and strengthened on the inside by means of braces *f*, of the form shown in Fig. 4 or of any other suitable form.

On the outer side of each of the sides or ends D is a flange, G, of cast metal, having in the center a perforated boss or axial enlargement, *g*. These two flanges G are bolted or riveted to the sides or ends D, and constitute the hub of the wheel. The shaft H passes through this hub, which is secured to it by set-screws *h*, passing through the bosses *g* and bearing against the shaft. The shaft H carries a crank, J, at each end. The crank is connected to the shaft by a screw, H^2, having an eye at its upper end. The eye fits on the end of the shaft, and is secured thereto by a set-screw, h^2. The threaded portion of the screw engages with an internally-threaded socket in the upper portion of the crank. Said threaded portion is provided with two grooves, h^4, diametrically opposite each other, and the socket of the crank is provided with a set-screw, *j*, for engagement with said grooves. When the crank is to be lengthened or shortened, in order to accommodate it to the legs of the operator, the set-screw h^2 is loosened and the crank is removed from the shaft. The screw H^2 is then screwed in or out of the socket, as the case may require, and when the proper adjustment is obtained the set-screw *j* is engaged with the groove h^4, to prevent the screw H^2 from turning, and the crank is replaced and secured by the set-screw h^2.

Each crank is provided with a foot-piece, which may be either as shown in Figs. 1, 2, and 4 or as shown in Figs. 8 and 9.

In Figs. 1, 2, and 4 the foot-piece is shown as consisting of two concave rollers journaled in two connecting-bars. The end of the crank passes through the bars k^2, midway between the rollers k^3, and a nut on the end of the crank secures the foot-piece in place, but allows the crank to turn freely in the bars.

In the ordinary velocipede the foot-piece consists of a single roller surrounding the crank; but by providing the two rollers above described, larger than the crank and on either side thereof, a broader bearing is furnished for the foot.

If desired, a plate of the same shape as the foot may be arranged on the top of the rollers k^3, and may be adjustable in any suitable manner.

In Figs. 8 and 9 the foot-piece is shown as consisting of a plate or sole, S, corresponding with the shape of the foot. To the bottom of the sole is attached a tube, S^2, provided with an internal screw-thread. This tube fits on the upper end of a bar, J^2, which is externally threaded for the purpose. The lower end of the bar J^2 is also screw-threaded, and carries a weight, J^3, which is preferably in the shape of a flattened ball. Midway of the length of the bar J^2 is an eye, through which a screw, J^4, passes into the end of the crank J, and thus secures the foot-piece to the crank, with a washer on each side of the eye. The weight J^3 is so adjusted as to keep the foot-piece above the crank and in position for the reception of the foot of the operator. By this construction and arrangement the foot-piece may be adjusted higher or lower, at the pleasure of the operator, and the weight adjusted to hold the foot-piece in position. Moreover, a swivel motion is allowed to the foot-piece, to accommodate it to the motion or position of the foot of the operator. By means of the screw J^4 the foot-piece may be adjusted nearer to or farther from the vertical portion of the crank, at the pleasure of the operator.

The shaft H is journaled in two pillow-blocks, L L, one on each side of the wheel. Each pillow-block is attached to and carried by a yoke, M, which is arranged to slide in vertical grooves or ways in a frame, P, rising up from the gunwale of the hull A, to which gunwale the base of the frame is secured by bolts or otherwise.

In the top of the yoke M works the swiveled lower end of a vertical rod or shaft, Q, which is screw-threaded, and works in a horizontal cross-bar of the frame P.

The upper end of the rod or shaft Q may be provided with either a square head or a hand-wheel, as may be preferred. Between the head or hand-wheel and the cross-bar of the frame is a nut, *n*, working on the rod or shaft Q.

When it is desired to raise or lower the shaft H, and with it the paddle-wheel, the rod or shaft Q is turned in the desired direction, either by means of the hand-wheel or by a key or wrench applied to the square head; and the nut *n* is adjusted so as to rest upon the cross-bar of the frame P and hold the rod or shaft Q at whatever height it may be adjusted to. By

this means the paddle-wheel may be raised or lowered, so as to cause the drum to bear more or less upon the water, and the paddle to dip more or less therein, at the pleasure of the operator. There may be on each side a gage for regulating the adjustment.

The paddle-wheel is covered by a cap or wheel-house, C^2, which may be made of wood, metal, or other suitable material. Its sides form somewhat more than a semicircle and extend down between the hulls. At the center it is provided with half-boxes c^2, (see Fig. 12,) which rest upon the shaft H.

To the periphery of the cap, in front and rear, diametrically opposite each other, are attached two screws, c^3, which work in slots in two standards, C^4, extending upward from the deck or from braces or cross-bars connecting the hulls, and are provided with thumb-nuts, c^6, outside of said standards. By this means the cap is held in place, and provision is made for oscillating it toward either the front or rear when desired. When the shaft and paddle-wheel are to be raised or lowered, as before described, the thumb-nuts c^6 are loosened, so as to allow the cap to rise or fall with the shaft, and tightened again when the adjustment is completed.

If it is desired to raise and lower the shaft H and the paddle-wheel independently of the cap or wheel-house C^2, the latter is provided with a vertical slot, *c*, on each side; and in these two slots the shaft H works as it rises and falls. To prevent the shipping of water through this slot it is covered with a plate, p^2, which is carried by the shaft H, and is arranged to slide in suitable ways or guides. As here shown, the plate p^2 is arranged inside of the cap or wheel-house; but it may be on either the inside or outside.

The seat or saddle *s* is attached to the cap or wheel-house, and the operator straddles said wheel-house. When the hulls A A are not decked, the cranks and the feet of the operator work in the hollows of the hulls. When said hulls are decked, the cranks and the feet work in cavities or recesses *r*, made for the purpose.

The seat *s* is provided with an elastic stem or rod, s^2, which passes through an eye in a standard, s^3, extending from the top of the cap C^2, and is secured by a set screw, s^4. By this means the seat may be adjusted forward or rearward, at the pleasure of the operator.

For steering the boat, each hull is provided with a rudder and each rudder with a tiller. The two tillers are slotted for a portion of their length, and each tiller extends at an obtuse angle from its rudder, so as to intersect the other tiller. At the point of intersection they are engaged by a pin, *t*, near the front edge of a disk or wheel, T, which is journaled on a vertical bearing on the deck or on a bar connecting the two hulls.

To the rear edge of the disk or wheel T is attached a rope, R, doubled midway of its length. The ends of the rope are passed over pulleys and under the decks of the two hulls A A; thence under pulleys and up through pipes or tubular rods or flag-staffs V; thence over pulleys and out of said tubes V to a horizontal lever, W, pivoted on a vertical standard, *w*, immediately in front of the seat or saddle *s*.

From the foregoing description it will be apparent that when the operator turns the lever W on its pivot one end of the rope R is drawn forward by said lever, and consequently the wheel T, to which the rope is attached, will be rotated on its axis, and draw back the other portion of the rope, so that when the lever W is rotated in a reverse direction a corresponding movement is imparted to said wheel T. By this means the operator is enabled to steer the boat in the same manner as an ordinary velocipede, and the two rudders are moved simultaneously and parallel with each other.

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

1. The combination, with the two hulls and the paddle-wheel arranged between the same and mounted upon a shaft journaled in vertically-adjustable bearings, and provided with cranks, of the treadles connected with said cranks by extensible and contractible connecting-rods, substantially as described, whereby the wheel-shaft and its operating devices may be adjusted in proper relation to each other.

2. The combination, with the two hulls A and the transverse-shaft H carrying the paddle-wheel, of the pillow-blocks L L, the yoke M, attached to and carrying the pillow-blocks, the screw-rod Q, swiveled to the said yoke, and the frames P, supported by the two hulls, and forming guides for the pillow-block above the hulls, all substantially as and for the purpose described.

3. The combination, with the paddle-wheel and its horizontal shaft, of the vertically-slotted wheel house or cap C^2, provided with half-boxes c^2 resting on the shaft, the lateral screws c^3, slotted standards C^4, and thumb-nuts c^6, arranged substantially as shown and described, whereby the wheel house or cap is capable of forward and rearward adjustment in relation to the paddle-wheel and its shaft, as set forth.

4. The combination, with the hulls A A, the transverse shaft H, carrying the paddle-wheel, and the wheel house or cap C^2, provided with the vertical slots *c*, in which the wheel-shaft is adjustable, of the vertical parallel plates p^2, secured to the wheel-shaft and arranged to move therewith on the inner sides of the wheel house or cap over the slots therein, substantially as described.

5. The wheel house or cap C^2, provided with the vertical standard s^3, having an eye and a set-screw, s^4, in its upper portion, in combination with the seat *s*, provided with a horizontal elastic stem, s^2, arranged in the eye of the vertical standard, substantially as described, whereby a person occupying the seat can strad-

dle the wheel house or cap for operating the paddle-wheel, as set forth.

6. In a catamaran constructed as herein described, the combination, with the rudders of the two hulls and the tillers thereof, each tiller extending at an obtuse angle from its rudder, being slotted for a portion of its length, of the disk or wheel T, provided with the pin *t*, the rope R, the two flag-staffs V V, and the lever W, pivoted on a vertical standard in front of the seat or saddle, all arranged and operating as and for the purpose herein set forth.

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