(No Model.) 2 Sheets—Sheet 1.

G. F. CREMER.

MARINE VELOCIPEDE.

No. 551,367. Patented Dec. 17, 1895.

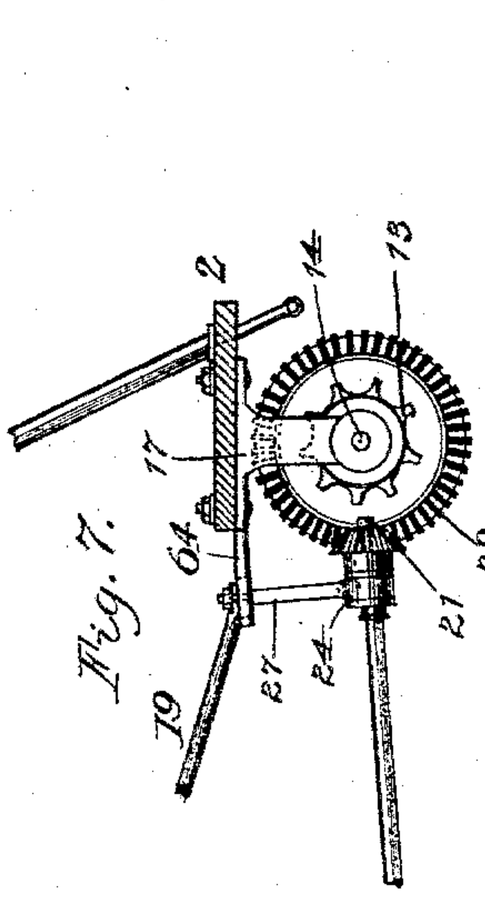

Fig. 7.

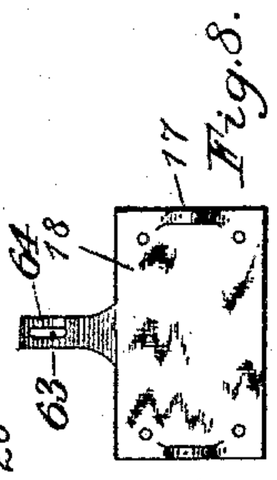

Fig. 8.

Fig. 1.

Fig. 9.

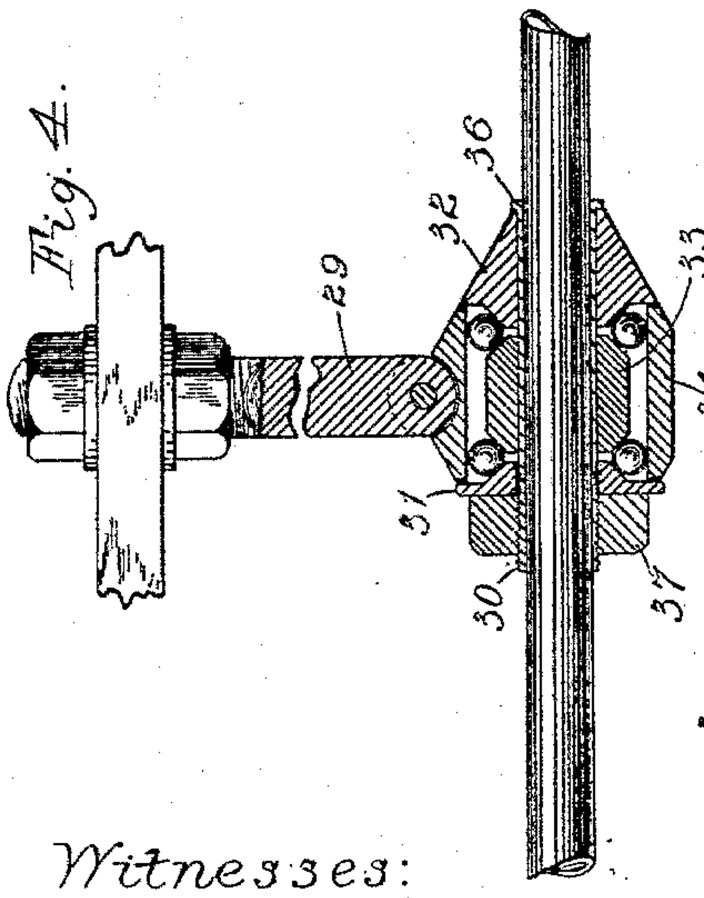

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses:
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A. S. Johnson.

Inventor:
George F. Cremer.
per: I. Thurman
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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MARINE VELOCIPEDE.

No. 551,367. Patented Dec. 17, 1895.

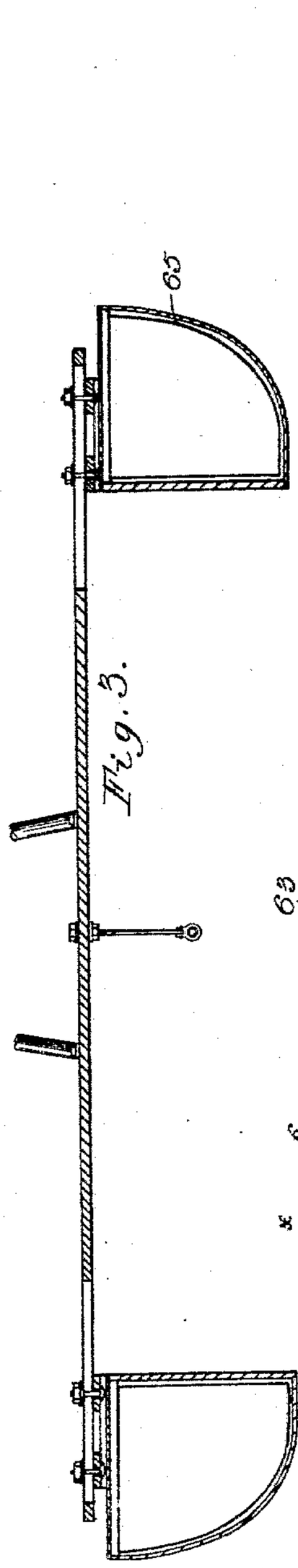

Fig. 3.

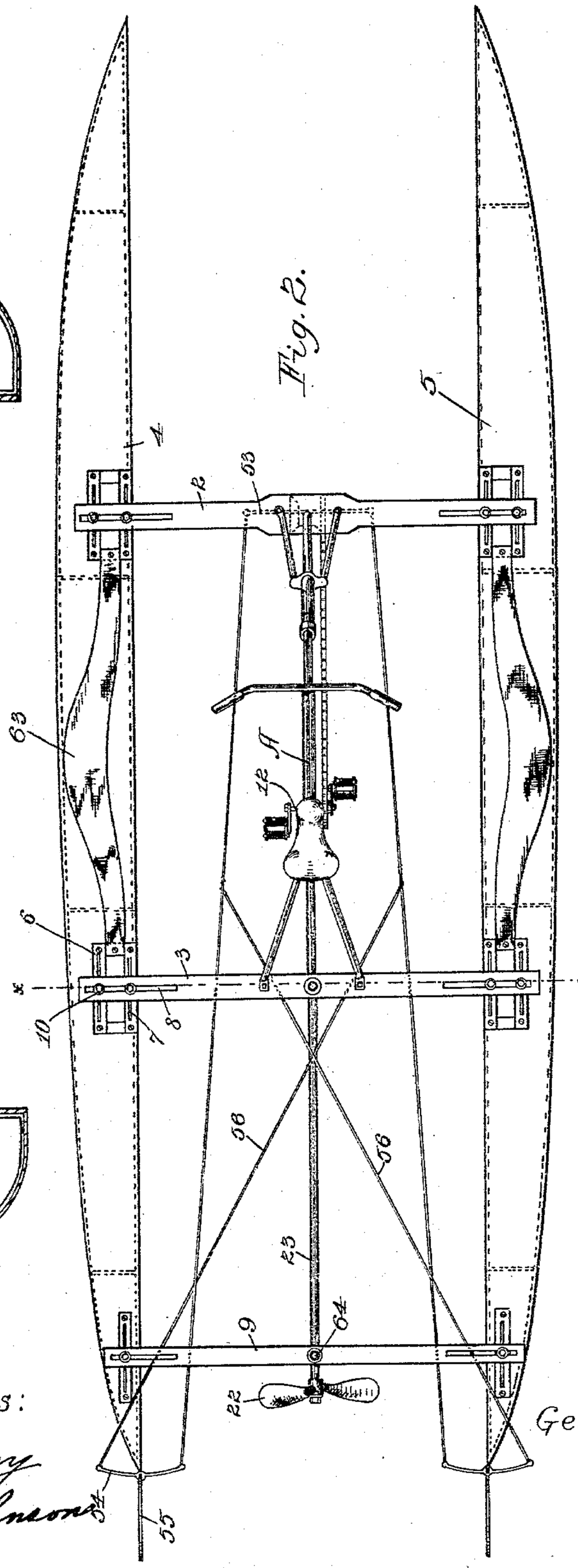

Fig. 2.

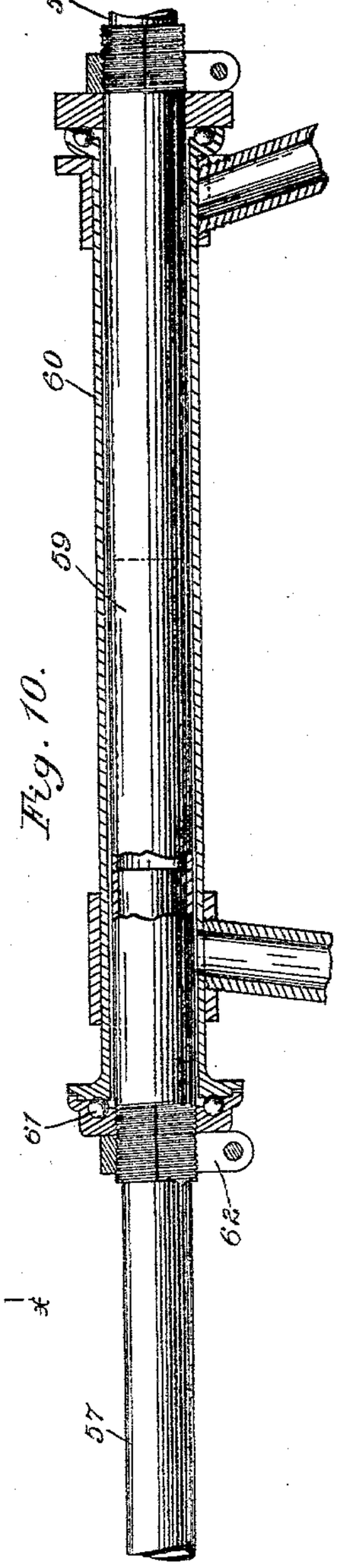

Fig. 10.

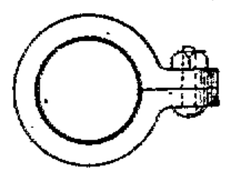

Fig. 11.

Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE F. CREMER, OF ST. PAUL, MINNESOTA.

MARINE VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 551,367, dated December 17, 1895.

Application filed January 9, 1895. Serial No. 534,286. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. CREMER, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Water-Bicycles, of which the following is a specification.

My invention relates to improvements in marine velocipedes, its object being to provide an improved construction thereof and simple, easily-operated means for steering and propelling the same.

To this end my invention consists in providing a pair of similar hulls or shells arranged parallel with each other and having a bicycle-frame secured intermediate thereof. The vessel is driven by means of a screw-propeller operatively connected with the foot-pedals by means of suitable gearing, and each hull is preferably provided with a rudder, which is connected with and actuated by the handle-bar. The cross-bars connecting the two hulls or shells and supporting the frame and propelling connections are provided with means for adjustment longitudinally of the shells and also for the adjustment of the hulls toward and from each other. The propeller-shaft is supported by means of vertically-adjustable hangers depending from the cross-bars, the hangers being preferably provided with ball-bearings, in which the shaft turns. The propeller-shaft is also adapted to be adjusted longitudinally to compensate for different-sized gearing.

My invention further consists in the improved features of construction hereinafter more particularly described, and pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of my machine. Fig. 2 is a top elevation illustrating the steering and propelling attachments and the adjustable connections between the hulls and cross-bars. Fig. 3 is a cross-section of the same, taken on line $x\ x$ of Fig. 2. Fig. 4 is a sectional detail of one of the rear bearings for the propeller-shaft, and Fig. 5 is a similar view of the forward bearing. Fig. 6 is a detail of the hanger for supporting the rear bearing for the propeller-shaft. Fig. 7 is a detail of the bevel-gear, sprocket and pinion at the front of the machine, by which power is transmitted to the propeller. Fig. 8 is a plan view of the supporting-plate for the gear and sprocket, secured to the under side of the front cross-bar. Fig. 9 is a detail of one of the end bearings for the driving-shaft. Fig. 10 is a longitudinal section of the handle-bar standard, the inner inclosing tube being broken away to show the inclosed bar, and Fig. 11 is a detail of one of the clamps for securing the tube upon the bar.

In the drawings, A represents the bicycle-frame provided with the necessary seat, handle-bar, pedals, &c. This frame is supported upon the cross-bars 2 and 3, which connect the hulls 4 and 5. These hulls are preferably of the form shown in the drawings and are shown filled with air-tight cans, so that in case of puncture the extire hull will not become filled with water. Secured to the tops of the hulls are the plates 6, provided with longitudinal slots 7, passing through which slots and similar slots 8 in the cross-bars 2, 3 and 9 are bolts 10 to provide for the adjustment of the cross-bars longitudially of the hulls and for the adjustment of the hulls toward and from each other.

Running from the sprocket 11 upon the pedal-shaft 12 of the frame A to the sprocket 13, mounted upon the driving-shaft 14, is the sprocket-chain 15. The shaft 14 is journaled in ball-bearings 16 in the downwardly-depending lugs 17 of the plate 18, the plate 18 being secured to the under side of the cross-bar 2 and projecting rearwardly from the same, forming support for the rod 19 of the bicycle-frame. Meshing with the bevel-gear 20, also mounted upon the driving-shaft, is the pinion 21, connected with the screw 22 at the rear of the machine by means of the shaft 23. The propeller-shaft 23 is supported in the ball-bearings 24, 25 and 26, the bearing 24 being supported by means of the hanger 27, connected to the plate 18, and the bearings 25 and 26 being similarly supported from the cross-bars 3 and 9 by the hangers 28 and 29. The hanger 27, as shown in Fig. 7, passes through the slot 63 in the rearwardly-extending arm 64 of the plate 18, and is connected upon the opposite side of the slot to the rod 19 of the bicycle-frame. This rod 19 is provided with a turnbuckle 65, by which its length may be varied in the adjustment of the parts.

In the bearing 25 (see Fig. 4) the propeller-shaft is inclosed by the tube 30, preferably brazed thereto. The end pieces 31 and 32 of the bearing and the inner block 33 fit closely to the tube 30 and turn with it in the rotation of the shaft. Between the block 33 and the collar 34 are placed the balls 35 of the bearing. The collar 34 is pivotally connected to the hanger 29, projecting downward from the cross-bar. The different parts of the bearing are held in contact by means of the lug 36 upon one end of the tube engaging one end of the bearing and the nut 37 screw-threaded to the tube and abutting against the other end of the bearing.

In the bearing 24 (see Fig. 5) the end pieces 38 and 39 are secured to the shaft and revolve therewith. The inner collar 40 and the outer collar 41, formed by the bottom of the hanger 27, remain stationary in the turning of the shaft and the other parts of the bearing bear against them. The balls 42 of the bearing are placed between the fixed and turning parts. The pinion 21 and the collar 43 separating the pinion from the bearing are also secured to the shaft by means of the spline 44. The different parts of the bearing and the pinion are held in contact by means of the nut 45, screw-threaded upon the shaft and engaging one end of the bearing, and the nut 46 also screw-threaded upon the shaft and abutting against the pinion. The shaft is made in two pieces, the part 47, carrying the bearing and pinion, fitting into the body of the shaft so as to be easily removed therefrom for the purpose of removing the bearing.

In Fig. 9 is shown a detail of one of the bearings 16 for the driving-shaft 14. In this form of bearing the parts 48 and 49 and the encircling collar formed by the end of the lug 17 remain stationary, and the shaft revolves therein upon the balls 50, traveling in the groove 51.

The handle-bar standard of the bicycle-frame extends down through the cross-bar 2 and has secured to its lower end the cross-piece 53. The ends of this cross-piece are connected with the tillers 54 of the rudders 55 by means of the ropes or wires 56 in such manner that they can both be operated simultaneously by the turning of the handle-bar.

I show in Fig. 10 an improved form of handle-bar standard for use with my machine. In this form the standard is made in two sections 57 and 58, fitting closely into the ends of the tube 59, which in turn is adapted to turn inside the hollow sleeve or case 60 upon the interposed ball-bearings 61. The ends of the tube 59 are slitted, so that they will give, and are clamped upon the ends of the standards by means of the clamps 62. The clamps 62 also hold the tube 59 from vertical movement in the sleeve 60. With this form of standard the bar turns freely in the outer sleeve, and either section of the bar can be independently adjusted by the loosening of the clamp.

While I show in the drawings and prefer to use a steering-rudder hinged to the rear of each of the hulls, it is evident that this arrangement can be modified and one rudder instead be placed intermediate of the rear of the hulls.

Secured to the tops of the hulls are the foot-rests 63 to be used in mounting to prevent breaking through the tops of the hulls.

By means of the adjustable connections between the cross-bars and the hulls the bars may be adjusted longitudinally of the hulls and the hulls adjusted toward and from each other at will. The propeller also may be raised and lowered by means of the nuts 64 upon the ends of the hangers supporting the propeller-shaft.

It will be evident that on account of the adjustability of the forward hanger in the slot 63 and of the cross-bars connecting the hulls, which serve as longitudinally-adjustable supports for the other two hangers, the propeller-shaft can be adjusted longitudinally to compensate for different-sized gearing upon the counter-shaft when different relative speed is desired.

I claim—

1. In a marine velocipede, the combination with the pair of similar hulls, of means for adjusting said hulls toward and from each other, the bicycle frame carried by said hulls and means for adjusting said frame longitudinally thereof.

2. In a marine velocipede, the combination of the pair of similar hulls, the connecting cross bars and the connections between said bars and hulls whereby the bars may be adjusted longitudinally of the hulls or the hulls adjusted toward and from each other.

3. In a marine velocipede, the combination with the pair of similar hulls, of the connecting cross bars longitudinally adjustable of said hulls, the bicycle frame supported upon said bars and the means for adjusting said frame thereon.

4. In a marine velocipede, the combination with the pair of similar hulls, the connecting cross bars, and the pedal carrying frame supported thereon, of the propeller, its shaft, the hangers depending from said cross bars and having ball bearing support for said shaft, said hangers being vertically adjustable to adapt themselves to the different angular positions of said shaft, and the operative connection between said shaft and the pedals of the frame.

5. In a marine velocipede, the combination with the pair of similar hulls, their connecting cross bars and the pedal carrying frame supported thereon, of the propeller, its shaft and the vertically and horizontally adjustable hangers for said shaft.

6. In a marine velocipede, the combination with the pair of similar hulls, the connecting cross bars longitudinally adjustable of said hulls and the pedal carrying frame supported upon said bars, of the counter shaft arranged underneath one of said cross bars, the sprocket wheel mounted upon said shaft and

operatively connected with the pedals of the frame, the propeller, its shaft, the bevel gear upon said shaft meshing with a similar gear upon the counter shaft, and the means for adjusting said propeller shaft longitudinally to compensate for different sized gear upon said shaft.

7. In a marine velocipede, the combination with the pair of similar hulls and the connecting cross bars, of the pedal carrying frame supported thereon, the propeller, its shaft, the vertically adjustable hangers for said shaft, the supports for said hangers adjustable longitudinally of said hulls, and the operative connection between said propeller shaft and the pedals of the frame.

8. In a marine velocipede, the combination with the hulls and the connecting cross bar, of the lugs depending from said cross bar, the counter shaft having journal support in said lugs and operatively connected with the driving mechanism, the projection extending rearwardly from said cross bar, the depending standard adjustable along said projection to and from said cross bar, the propeller shaft having journal support upon said depending standard, its bevel pinion and the bevel gear carried by said counter shaft and meshing therewith.

9. In a marine velocipede, the combination with the pair of similar hulls, the connecting cross bars and the pedal carrying frame supported thereon, of the plate secured underneath the forward cross bar and serving as a support for the end of the propeller shaft, the lugs depending from said plate, the counter shaft having journal support in said lugs preventing longitudinal movement of said shaft, the propeller, its shaft, the vertically adjustable supports for said shaft, the operative connection between said counter and propeller shafts and between the pedals and counter shafts.

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

GEORGE F. CREMER.

Witnesses:
T. D. MERWIN,
H. S. JOHNSON.