No. 731,514. PATENTED JUNE 23, 1903.

M. N. & D. R. SHEEN.

PROPELLING MECHANISM FOR BOATS.

APPLICATION FILED FEB. 5, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

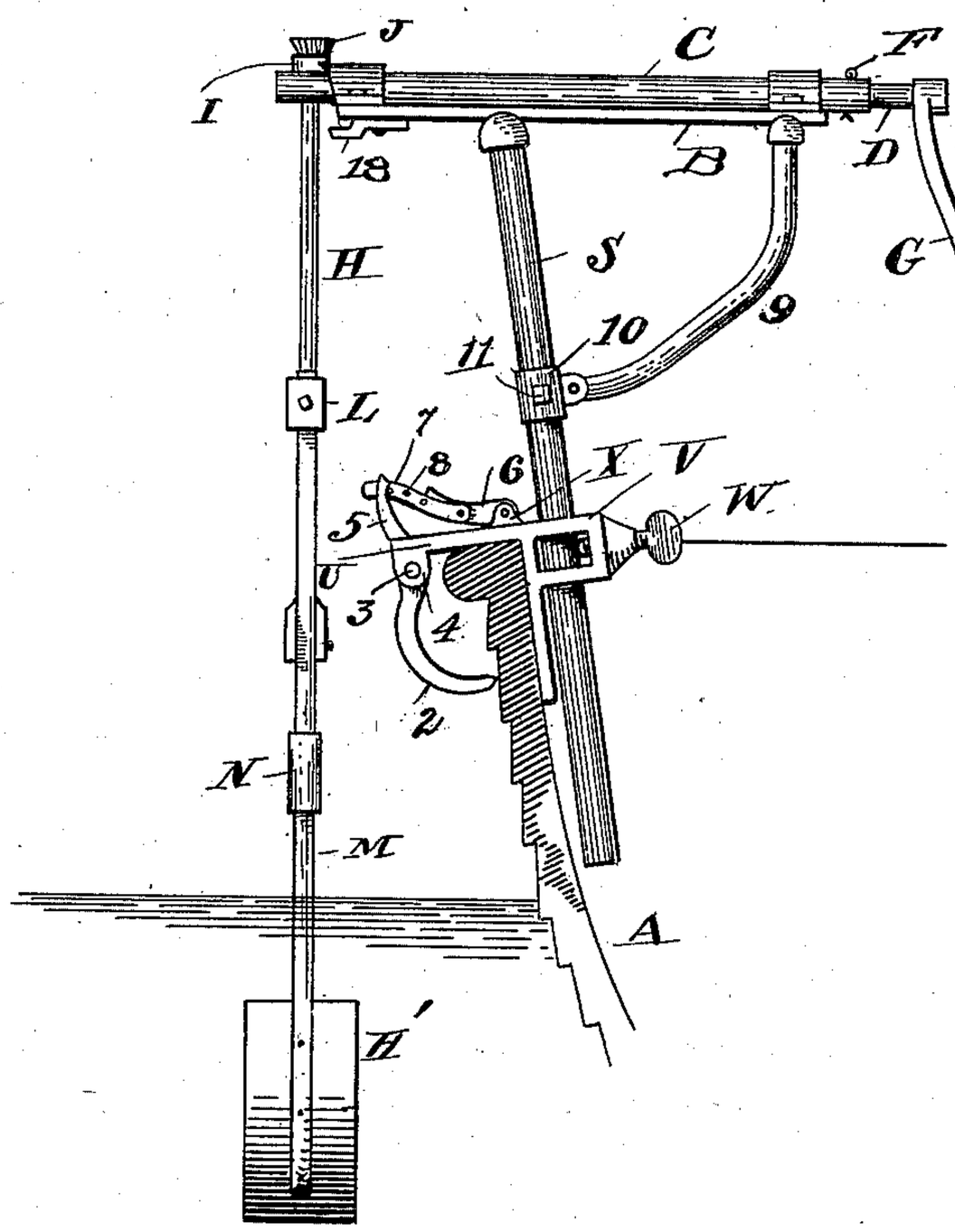


FIG. 1.

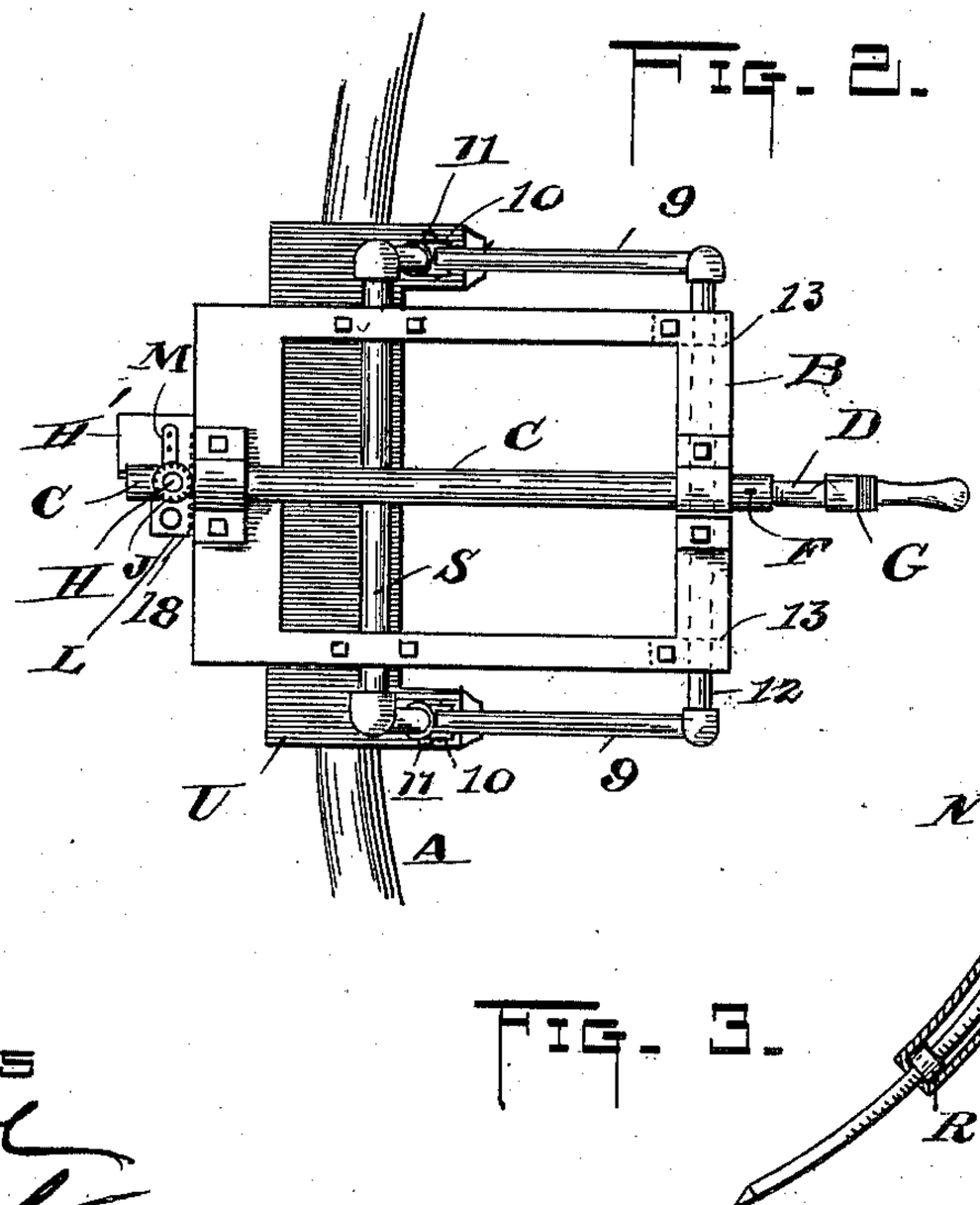


FIG. 2.

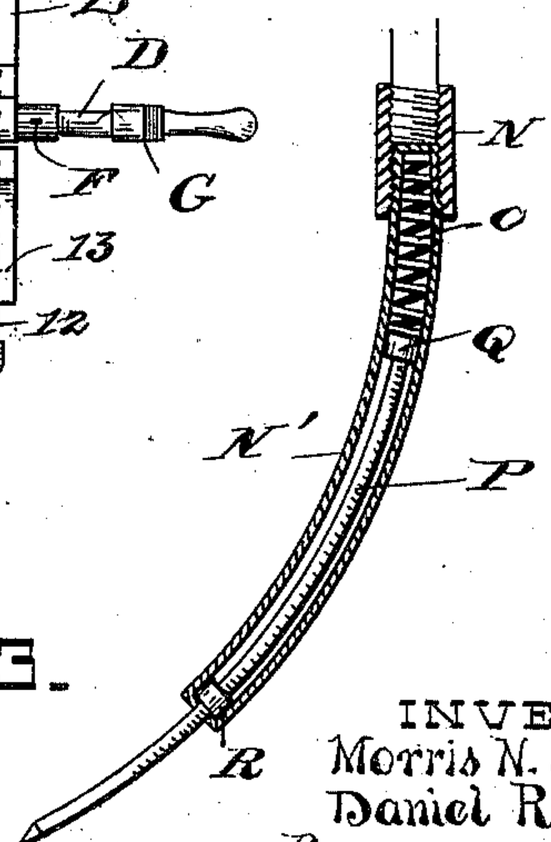


FIG. 3.

WITNESSES
E. J. Thurlow
J. H. Blunck

INVENTORS
Morris N. Sheen,
Daniel R. Sheen,
By L. N. Thurlow,
Att'y.

No. 731,514. PATENTED JUNE 23, 1903.

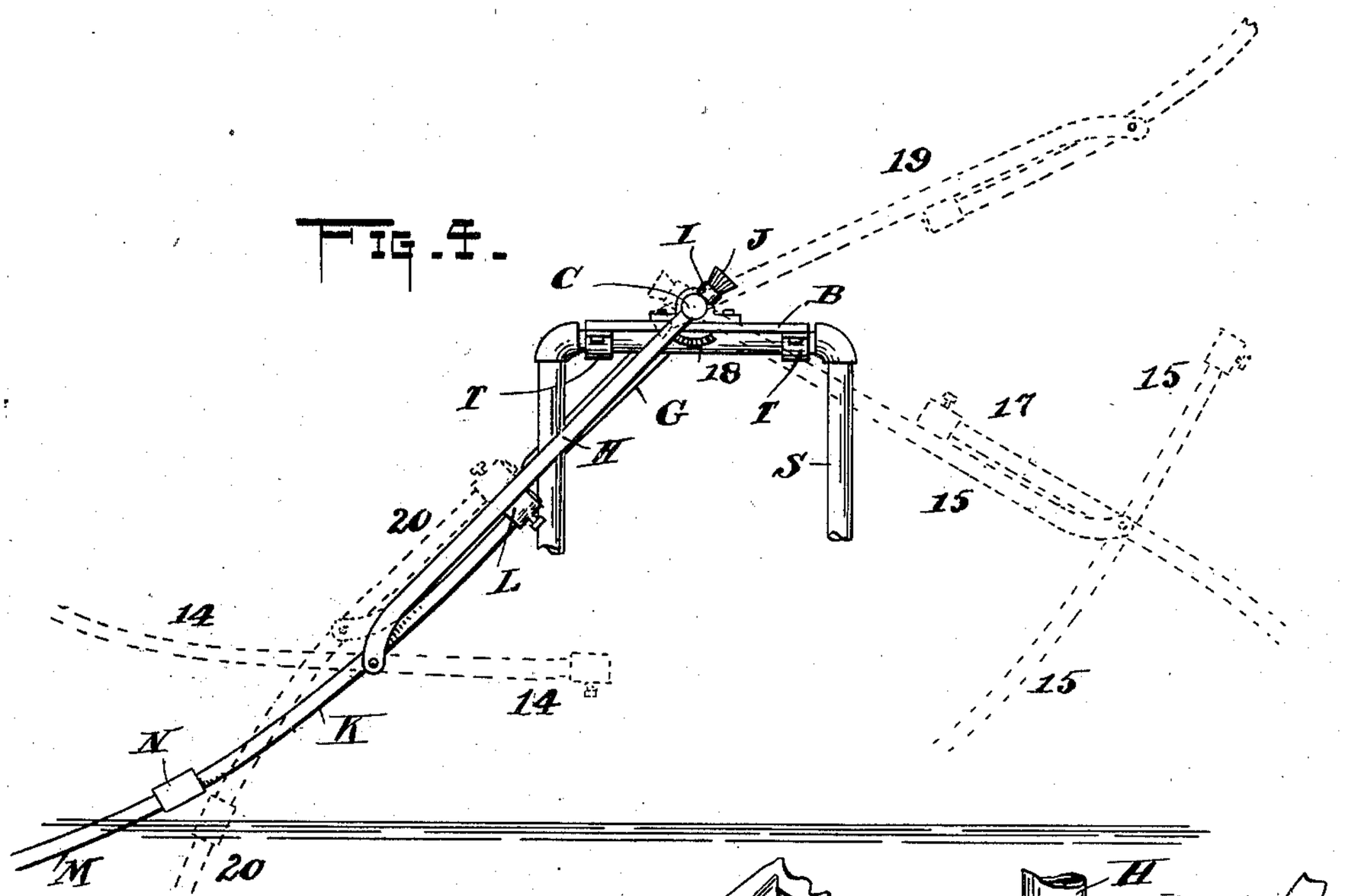
M. N. & D. R. SHEEN.

PROPELLING MECHANISM FOR BOATS.

APPLICATION FILED FEB. 5, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

FIG. 4.



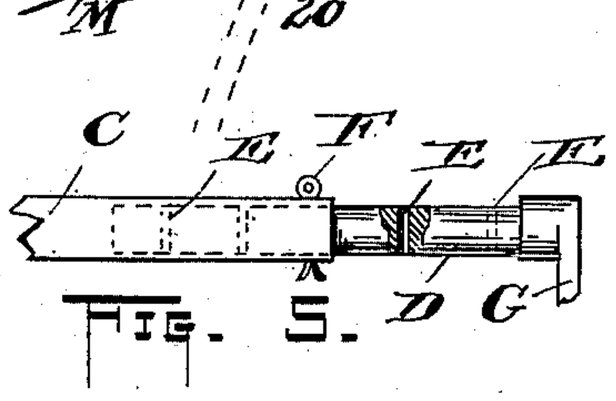


FIG. 5.

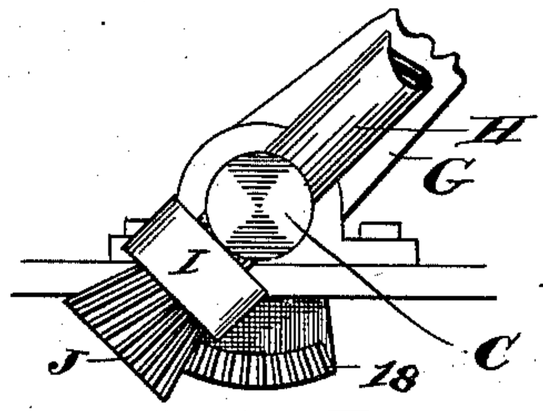


FIG. 6.

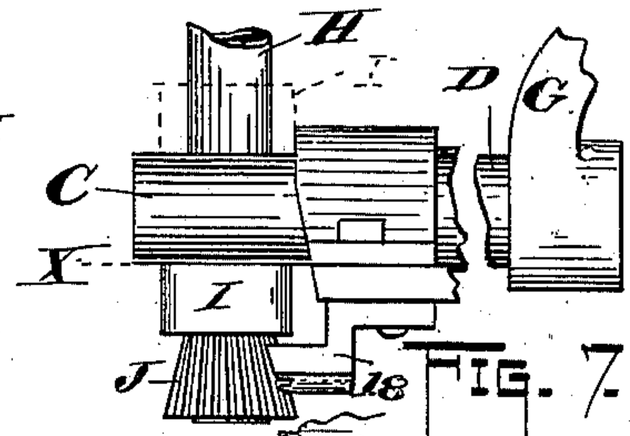


FIG. 7.

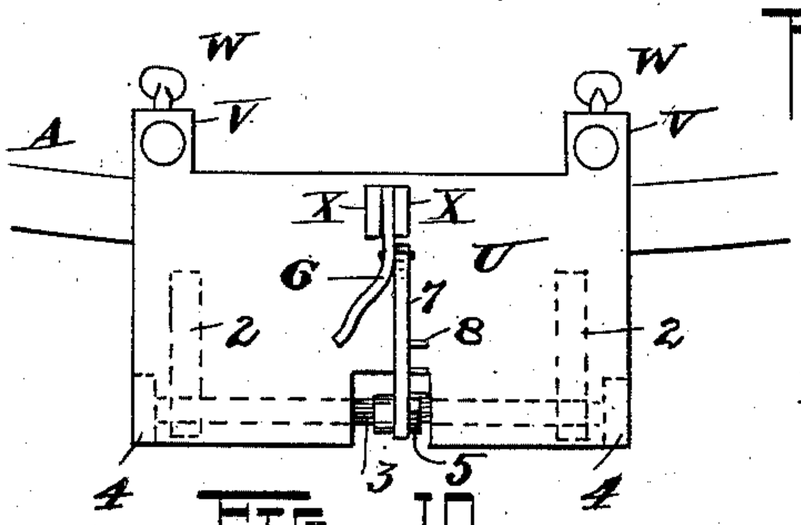


FIG. 10.

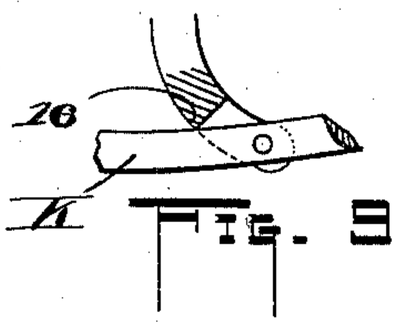


FIG. 9.

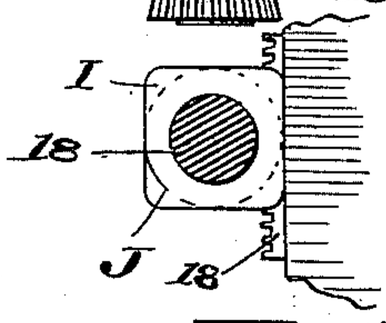


FIG. 8.

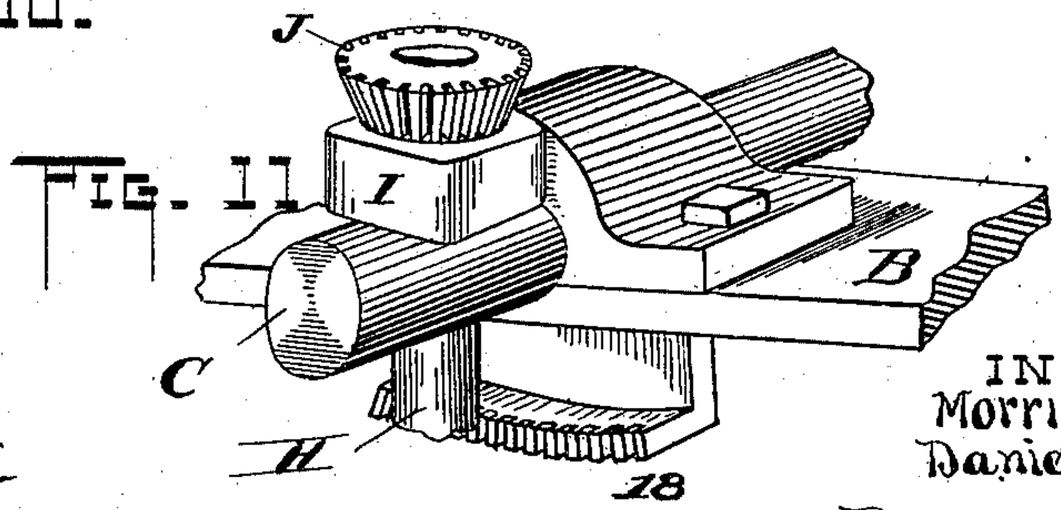


FIG. 11.

WITNESSES
E. J. Arnold
H. B. Munch

INVENTORS
Morris N. Sheen,
Daniel R. Sheen,
By L. N. Thurlow,
Att'y.

No. 731,514. Patented June 23, 1903.

UNITED STATES PATENT OFFICE.

MORRIS N. SHEEN AND DANIEL R. SHEEN, OF PEORIA, ILLINOIS.

PROPELLING MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 731,514, dated June 23, 1903.

Application filed February 5, 1903. Serial No. 141,973. (No model.)

To all whom it may concern:

Be it known that we, MORRIS N. SHEEN and DANIEL R. SHEEN, citizens of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Propelling Mechanism for Boats; and we 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.

This invention pertains to improvements in bow-facing rowing mechanism for boats.

An object of the present invention is to provide a simple rowing mechanism of low cost that can be used in propelling boats while the oarsman faces the bow of the boat.

Another object of such invention is to furnish a rowing mechanism of the character described and combine therewith a simple means of reversing the position of the paddles to face in the opposite direction, so that the boat may be rowed in either direction at will.

A further object is to provide a paddle that will automatically assume a proper position for entering the water for a stroke, such position being acquired by momentum alone.

Another object is to combine with such mechanism a device for adjusting the mechanism to a perpendicular position regardless of the angle of inclination of the gunwale of the boat.

All of these objects will be more clearly pointed out in the accompanying drawings and in the following specification.

In the said drawings, Figure 1 is a transverse section of one side of a boat, showing our rowing mechanism attached thereto. Fig. 2 is a plan view of the same. Fig. 3 is a sectional view of an attachment for the device for use on ice for propelling sleds. Fig. 4 is an elevation of the rowing mechanism, showing several positions of the paddle in broken lines. Fig. 5 is a view of adjusting means for a crank used for operating the paddle. Fig. 6 is a view of the paddle-reversing device. Fig. 7 is also a view of that device. Fig. 8 is a top view of Fig. 7 on line *x*. Fig. 9 is a detail view of a portion of the arm of one of the paddles, showing pivotal attachment to an arm for carrying it. Fig. 10 is a top view of means for clamping the mechanism to the gunwale of the boat. Fig. 11 is a perspective view of the paddle-reversing means shown in Figs. 6, 7, and 8.

In the figures, A indicates the boat, on the gunwale of which our improved rowing mechanism is clamped, as shown in Fig. 1. We first provide a frame B, upon which is journaled a shaft C, lying at right angles to the length of the boat. Said shaft is tubular and receives a rod D, provided with a series of holes E, Fig. 5, constituting means for adjusting said rod within the tubular shaft by means of a split pin F, passing also through the said shaft B. The rod described carries a crank G, used for the rowing operation. The opposite or outer end of the shaft B carries an arm H, which passes therethrough and designed to turn therein, as in a bearing. Above the shaft or on the end of the said arm is secured a square block I, which lies next the said shaft, and adjacent to such block is a beveled pinion J. The lower end of the arm H is bifurcated and bent substantially as shown in Fig. 4, such bifurcated end carrying a curved paddle-arm K, said arm being balanced on the pivot which supports it. A weight L is preferably carried on the upper end of the paddle-arm, the use of which will be described later. The paddle-arm described carries at its lower end the blade H′, which may be flat or slightly dished, so as to hold the water. The latter portion is attached to a portion M, which by means of a threaded sleeve N, Fig. 3, is secured detachably to the paddle-arm. Just here we desire to describe an attachment (shown in Fig. 3) referred to which is to be used in propelling vehicles over ice. Such attachment comprises a curved hollow bar N′, designed to be screwed into the sleeve N, already mentioned. A spring O occupies a position in the upper end of the hollow bar and receives the pressure of a curved rod P, the upper end of which carries an enlargement Q, forming the contact for the said spring. The lower extremity of the rod P also carries an enlargement R, which, contacting with the closed end of the said hollow bar N′, serves to prevent the rod P slipping out and being lost. Returning now to the frame B, we mount this portion upon an inverted-U-shaped frame S, Figs. 1 and 4, by means of the bearings T, the extremities of such

frame being held in a clamp on the gunwale of the boat. This clamp consists of a plate U, Fig. 10, having cast therewith the hollow projections V for receiving the said extremities of the frame S, the screws W serving to securely hold the frame at whatever elevation desired. A portion of said plate depends within the boat and, together with a pair of claws 2, serves to firmly clamp the entire mechanism to the boat wherever wanted. The claws 2 consist of depending arms rigidly secured to a rock-shaft 3, carried in ears 4, cast with the under side of the plate U. At the middle of said shaft is an upwardly-extending arm 5, which when forced in one direction carries the claws 2 in the opposite direction. On the top of the plate U are two ears X, between which is pivotally carried lever 6, and to the lever is pivoted an arm 7, having at intervals pins 8, designed to bear against the arm 5. The relation of the lever 6 and the arms 5 and 7 is such that, as shown in Fig. 1, as the said lever is pushed down to the position shown it is locked after the manner of a toggle arrangement by reason of the pivot-point between the said arm 7 and lever 6 passing below the point at which the lever is carried on the ears. The pressure thus exerted is transferred through the arm 5 and claws 2 to the side of the boat, all of which will be readily understood. The clamp when made in this form, as a matter of course, will always occupy the same angle of inclination as that of the gunwale of the boat, and since all boats vary in the slant of their sides some provision must be made for keeping the shaft C in a horizontal position while in operation. To this end we provide a pair of arms 9, the lower ends of which are pivoted to sleeves 10, adjustable by set-screws 11, on the frame S. The upper ends of such arms 9 are connected by a cross-rod 12, which has bearings on the under side of the frame B at 13. It will be seen that if the frame S were to be carried farther away from the perpendicular the frame B would be tipped out of a horizontal position, as viewed in Fig. 1, and in order to adjust such frame to its proper position by lowering that portion within the boat the set-screws 11 must be loosened and the sleeves 10 permitted to slip downward, thus lowering said frame to a horizontal position. If the frame S is carried nearer the vertical position, the reverse movement of the sleeves would take place in order to again place the frame B in level position.

In the use of our improved rowing mechanism the operator faces the observer, Fig. 1, and faces toward the right in Fig. 4. In rowing the cranks G, only one of which is shown, are swung forward and backward or toward and away from the operator, thus rocking the shaft C and swinging the arm H and its paddle. In Fig. 4 the paddle has reached its limit of stroke in the water, as seen in unbroken lines. Since the paddle will naturally balance on its support, it reaches the position shown in broken lines at 14, it being understood that if balanced the paddle cannot remain in any position other than horizontal after leaving the water. By the backward movement of the crank G to take a new stroke the paddle still keeps a horizontal position until it reaches a position indicated at 15, the paddle being moved to this position with reference to the arm H by means of a shoulder 16, Fig. 9, which, as the said arm H arrives at the angle shown in said Fig. 4 at 15, causes the paddle to approach a more upright position. Then by the momentum imparted to it by the movement of the crank the paddle-blade is carried ahead by momentum, thus placing it as seen at 17 in broken lines in the figure named. Then by reversing the direction of movement of the crank for taking a stroke the paddle enters the water and finally arrives at the position in unbroken lines already described. At each movement of the crank the same result obtains in an automatic manner, requiring no attention on the part of the operator whatever. The weight L on the upper end of the paddle serves to counterbalance the paddle at the other end; but it may be adjusted so as to make the device balance more quickly after leaving the water, if desired.

In the patents issued to Daniel R. Sheen, numbered 646,041, 715,882, and 718,162, dated March 27, 1900, December 16, 1902, and January 13, 1903, respectively, it was aimed to combine with a boat-rowing mechanism means for reversing the position of the operating-crank with reference to the paddle, so that the boat could be rowed backward when desired by reversing the position of the said handle, and it is the purpose of the present application to improve on the forms therein shown and described, and the form now used may be understood from the following: We have already alluded to the beveled pinion and the square block J and I, respectively, carried on the paddle-carrying arm H, and it will be noted that the former is designed to engage with a rack 18 of curved form, which is secured to the portion B beneath the outer bearing for the shaft C and is so placed that as the paddle is raised by the crank G in swinging it in a full revolution the pinion meshes with it. Now since the rack is stationary and the arm H is revoluble within the shaft C the pinion which is secured to such arm will be forced to turn, and with it the said arm, thereby turning the arm and paddle a half-revolution, being then in the reversed position shown in Fig. 4 at 19. The relation of the pinion to the rack is such that said arm H can only be turned the exact one-half of a revolution. It will now be seen that by continuing the movement of the crank by carrying it around to the lower position, as shown in Fig. 1, the paddle will not enter the water from the opposite direction from that heretofore entered, but will attain and retain a horizontal position on ar-

riving at about the position indicated at 19, described, and will pass to the position at the left of Fig. 1 and finally enter the water, as at 20, in such figure. By the same movement of the crank as described hereinbefore it will be understood and, in fact, readily seen that the direction of the boat will be reversed, so that the operator will be moving backward instead of forward. In this way he is immediately able to reverse the direction of the boat in a very positive manner. The bearing for the shaft C, adjacent to the block I, it will be observed, approaches said block so that the flat surface thereof will contact with such bearing, and being rigidly secured to the arm H will prevent rotary movement of the latter within its support in the shaft C. This, however, is true only when the paddle is at work. When it is raised to be reversed in position, the block is free to turn, for the reason that the bearing is cut away, as shown in Figs. 1 and 7, so that it recedes from the top thereof to the bottom. While still moving the boat backward, as above described, if it is desired to proceed forward the operator again turns the crank a full revolution and imparts the backward-and-forward movement thereto after so doing, as before, and the boat will proceed in the other direction.

The operator need pay no attention to the action of the paddles, but simply impart to them the vibratory movement by the cranks, and when desiring to reverse the direction of movement of his boat merely describes the full revolution and again takes up the vibratory movement, as before. The simplicity of the arrangement is thus at once evident.

We desire to state that we do not wish to confine ourselves to the construction shown and described, since changes of one kind or another may be made without departing from the spirit and intent of the invention.

It is our purpose in this application, as in those patents issued to Daniel R. Sheen and hereinbefore mentioned, to so carry the paddle that it will be self-feathering, or, in other words, will carry itself through the air in such a way that practically no wind-surface will be presented, and therefore very little effort is required to operate the device, and the boat is not retarded by wind-pressure from this source. It is also our purpose to employ a paddle which by no other force than the momentum acquired thereby in moving through the air will assume a proper position for entering the water for taking a stroke, as already intimated, such purpose not having been accomplished in this particular manner heretofore to our knowledge.

In turning the boat around the operator need but operate one of the paddles, or if it is desired to make a short turn the paddle toward the direction in which it is desired to turn may be reversed in position by turning the crank of that paddle a full revolution, as described, and both cranks then swung in opposite directions at the same time. By this means the turning of the boat will be quickly and properly done.

We claim—

1. In a propelling mechanism for boats, a shaft journaled on the boat and adapted to rock and to also have a rotary movement, a paddle-carrying arm at one end of the shaft the same adapted to rotate on its axis for the purposes described, and a paddle pivoted to such arm and to move therewith.

2. In a propelling mechanism for boats, a rock-shaft journaled on the boat the same adapted to have rotary movement in its journals for the purposes indicated, a paddle-carrying arm carried at one end of such shaft adapted to rotate on its axis and a paddle pivotally attached to the free end of said arm and balanced on its pivot for the purposes indicated.

3. In a propelling mechanism for boats, a rock-shaft having bearings on the boat, a paddle-carrying arm at one end thereof adapted to swing with the rocking of the shaft and having rotary movement about its axis for the purposes described and a paddle pivotally attached and balanced on the free end of said arm substantially as set forth.

4. In a propelling mechanism for boats, a rock-shaft, a paddle-carrying arm carried thereby and rotatable about its axis, and a paddle pivotally balanced on said arm for the purposes explained.

5. In a propelling mechanism for boats, a rock-shaft also adapted for rotary movement, a paddle-carrying arm at one end of said shaft the same adapted to rotate on its axis for reversing the position of the paddle as set forth, and a paddle pivoted to the said carrying-arm, the same being balanced thereon substantially as set forth.

6. In a propelling mechanism for boats, a rock-shaft journaled on the boat the same adapted for rotary movement as well, a paddle-carrying arm at one end thereof adapted for rotary movement about its axis, a paddle pivotally balanced on the free end of such arm, and means for imparting a rotary movement to the said arm when rotating the rock-shaft to carry the arm and paddle through a full revolution substantially as described.

7. In a propelling mechanism for boats, a rock-shaft on the boat the same being adapted also for rotary movement for the purposes indicated, a paddle-carrying arm journaled at one end of said shaft and adapted to rotate in the journal, means carried on the end of the arm adjacent to the shaft for assisting in rotating the arm and means also secured to a fixed portion of the mechanism with which the means on the arm engages whereby a full revolution of the shaft and the arm will turn the latter on its axis a half-revolution to reverse the position of the paddle for the purposes described, and a paddle pivotally balanced on the free end of the arm substantially as set forth.

8. In a propelling mechanism for boats, a

rock-shaft carried on the boat, the same adapted for a full revolution when desired, a paddle-carrying arm carried in the end of the shaft at right angles thereto, a paddle pivotally balanced at one end of the arm, means for automatically turning the arm with its paddle a half-turn about the axis of said arm for reversing the position of the paddle, and means also for preventing further movement of the arm about its axis while having a vibratory movement by the rocking of the shaft carrying the same, all being adapted to operate substantially as described and shown.

9. In a propelling mechanism for boats, a rock-shaft on the boat the same adapted to have a full revolution in its bearings when desired, a paddle-carrying arm journaled in and depending from the outer end of the shaft, a paddle pivotally balanced on said arm at its lower end, a pinion secured to the said arm, a rack secured to a fixed part of the mechanism which the pinion engages to turn the same and the arm when the latter is swung to a position where both the pinion and rack mesh with one another to reverse the position of the paddle, and means for preventing further movement of the said arm about its axis after the pinion and rack are disengaged.

10. In a propelling mechanism for boats, a rock-shaft, a paddle-carrying arm carried thereby and depending therefrom, a paddle pivotally carried at the lower free end of the arm, said paddle balanced on its pivot in a substantially horizontal position in the air between the end and the beginning of a stroke and also by the momentum thereof, swings through the air, to assume a position for entering the water for taking a stroke substantially as described.

11. In a propelling mechanism for boats, a rock-shaft, an arm depending therefrom outside the boat, and a paddle pivotally carried at the lower end of such arm, said paddle adapted to balance itself on its pivot to attain and retain a horizontal position while in the air after leaving the water at the end of a stroke and adapted also by momentum alone to assume an upright position for entering the water at the beginning of a stroke substantially as set forth.

12. In a propelling mechanism for boats, the rock-shaft C journaled above the boat, the crank G rocking the same, said shaft being capable of passing through a full revolution as desired, the arm H carried by said shaft, said arm adapted to turn about its axis, the paddle H′ carried on the arm H, the pinion J of the said arm, the rack 18 secured to the mechanism engaging the pinion at such times as the said shaft C is turned through a full revolution for reversing the position of the paddle for the purposes explained, and the block I secured to the said arm H for sustaining the paddle in its proper position for engaging the water.

13. In a propelling mechanism for boats, the shaft C carrying the paddle, a support B for the shaft, the frame S supported on the boat and to which the said frame S is pivoted, the arms 9 also having pivotal connection with the frame and having sliding connection with the said frame S and supporting the said portion B in a horizontal position regardless of the angle of inclination of the said frame S for the purposes explained.

14. In a propelling mechanism for boats, the frame S supporting the rowing portions, a clamp composed of the plate U, the projections V and screws W for receiving and holding the said frame S, the claws 2, the shaft 3 carrying the same, the arm 5 also on the shaft 3, the lever 6 pivoted to the said plate U, the arm 7 pivoted to such lever and the pins 8 engaging the said arm 5 all arranged substantially as set forth and described and for the purposes indicated.

In testimony whereof we affix our signatures in presence of two witnesses.

MORRIS N. SHEEN.
DANIEL R. SHEEN.

Witnesses:
L. M. THURLOW,
E. J. ABERSOL.