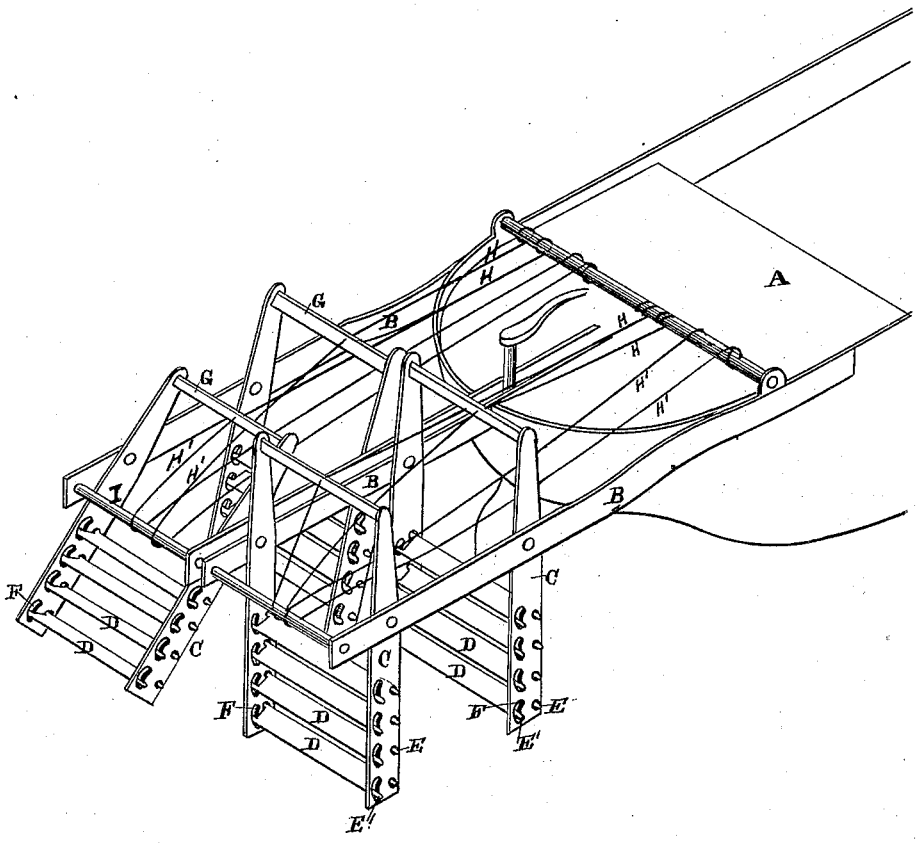
J. B. GREENE.

Wave-Power for Propelling Vessels.

No. 212,847. Patented Mar. 4, 1879.



Witnesses

Geo. H. Strong.

Frank A. Brooks

Inventor

Jas. B. Greene

By Dewey & Co

Attys.

UNITED STATES PATENT OFFICE

JAMES B. GREENE, OF ELLIOTT, CALIFORNIA.

IMPROVEMENT IN WAVE-POWERS FOR PROPELLING VESSELS.

Specification forming part of Letters Patent No. **212,847**, dated March 4, 1879; application filed September 2, 1878.

To all whom it may concern:

Be it known that I, JAMES B. GREENE, of Elliott, county of San Joaquin, and State of California, have invented an Improved Method of Propelling Vessels; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing.

My invention relates to propelling vessels by wave-power; and consists in mounting upon timbers or frames projecting over the end of the vessel a series of swinging frames provided with curved slots and carrying movable buckets or paddles. These buckets are hinged at their forward ends, and the after ends have a certain amount of vertical play. As the vessel rises and falls on the waves the buckets automatically alter their angles, so that the power of the wave will force the vessel ahead. Means are provided for raising the frames carrying the buckets out of the water when it is desired to stop their action.

The accompanying drawing is a perspective view of my invention.

A represents the boat or vessel to which my device for propelling vessels is applied. Attached to the upper after part of this vessel are the side and central supporting-timbers B, which project over the stern to any desired length. Hinged or pivoted to these timbers B are the bucket-frames C, which stand in a vertical position when in place for work. Two or more sets of these frames may be placed between the timbers on each side, so that each may be independent of the other, as shown.

The buckets or paddles D are arranged horizontally across between each of these frames, each frame having an independent set of buckets, and each bucket being capable of having an independent motion. At both ends of each bucket are two lugs or projections, E E′. The forward lug, E, at each end passes through holes in opposite sides of the bucket-frame, so as to form bearings, on which the bucket is hinged or pivoted.

The after lugs, E′, at each end of the bucket play in the curved slots F formed in the sides of the bucket-frame. These slots are cut an equal distance above and below the point where the forward lugs, E, on the buckets pass through the forward sides of the bucket-frames, and the rear lugs, E′, move loosely in these slots. By this means the rear ends of the buckets are allowed a certain amount of vertical motion, so that their faces may vary the angle in relation to the sides of the bucket-frames, for the purpose hereinafter described.

The upper ends of the side pieces of the bucket-frames extend upward above the sustaining-timbers B, and are joined together at their upper ends by a cross bar or brace, G. The paddles or buckets being only placed on the lower portion of the bucket-frame, an open space is left between the upper bucket, the sides of the bucket-frame, and the cross-bar G. A chain or rope, H, is secured in the center of the cross-bar G at the upper end of the bucket-frames, and leads to a windless or winch on the vessel's deck. Another chain or rope, H′, leads from the cross-bar G aft, and passes through a sheave or pulley attached to the bar I, which connects the rear ends of the supporting-timbers B. This chain then passes forward again, as shown, and leads to the windlass or winch. These ropes or chains for each frame may be formed so as to be endless, and the bight passed around the winch. Then, when both chains or ropes are hauled taut by one leading aft and the other forward, the bucket-frame is held firmly in position. When desired, by slacking one rope and hauling on the other, the bucket-frame may be turned on its hinge or pivot, so that the lower ends, carrying the buckets, may be lifted out of the water either for repairs or in case of danger of breakage from very heavy seas. Separate chains or ropes are provided for each bucket-frame, so that one or all of them may be moved, as desired.

The operation of my device is as follows: The supporting-timbers, bucket-frames, &c., are permanent fixtures on the vessel. When in position for operation the bucket-frames are held in a vertical position by the chains or ropes, as herein described. Now, as the vessel's bow goes down in a sea or swell, the stern rises, and as the stern rises pressure is brought on the buckets, the rear ends of which drop until the rear lugs in the slots bring up on the lower edge of the slots. The buckets are then at such an angle from the horizontal that the weight and pressure of the water will drive

the vessel ahead. As the bow again rises and the stern is depressed an opposite action of the buckets is induced, the rear ends rising to the upper ends of the slots and an opposing angle to the water, which will continue to force the vessel ahead. As there are several sets of bucket-frames and buckets on each side of the stern, in a cross and troubled sea each set of buckets will act in an independent manner in accordance with the motion of the rear of vessel; but, whether the motion is up or down, the buckets will offer opposing angles, which in either case will tend to drive the vessel ahead. The action of these buckets is similar to that of an oar in sculling, the force of the waves being applied to the buckets at an angle which will drive the vessel forward.

When it is desired to stop the vessel the frames may be drawn at such an angle from the perpendicular that the bucket will not operate to drive the vessel onward, or the frames may be thrown out of position, so as to lift the the buckets entirely out of water. In case of a very heavy sea, the rear bucket-frames may be turned up out of the water, and only those nearest the vessel kept in use.

A similar arrangement of bucket-frames and paddles may be placed at the bow and sides of the vessel, if desired, and the same effect will be produced. I may also, if desirable, so hinge the sustaining-timbers that on power being applied the frames may be plunged up and down in the water, and the buckets by their change of angle at each motion will tend to drive the vessel ahead.

I am aware it is not new to propel a vessel by means of a series of fixed frames provided with floats which are operated upon by the waves, and hence I do not broadly claim such buckets when used with stops; but,

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

The vessel A, in combination with projecting frame B and swinging frame C, controlled by cords H H′, provided with curved slots F and pivoted floats D, as set forth.

In witness whereof I hereunto set my hand.

JAMES B. GREENE.

Witnesses:
R. K. EVANS,
WM. M. MORSLE.