B. STEVENSON.

FISH TAIL PROPELLER.

APPLICATION FILED FEB. 7, 1913.

1,079,193.

Patented Nov. 18, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

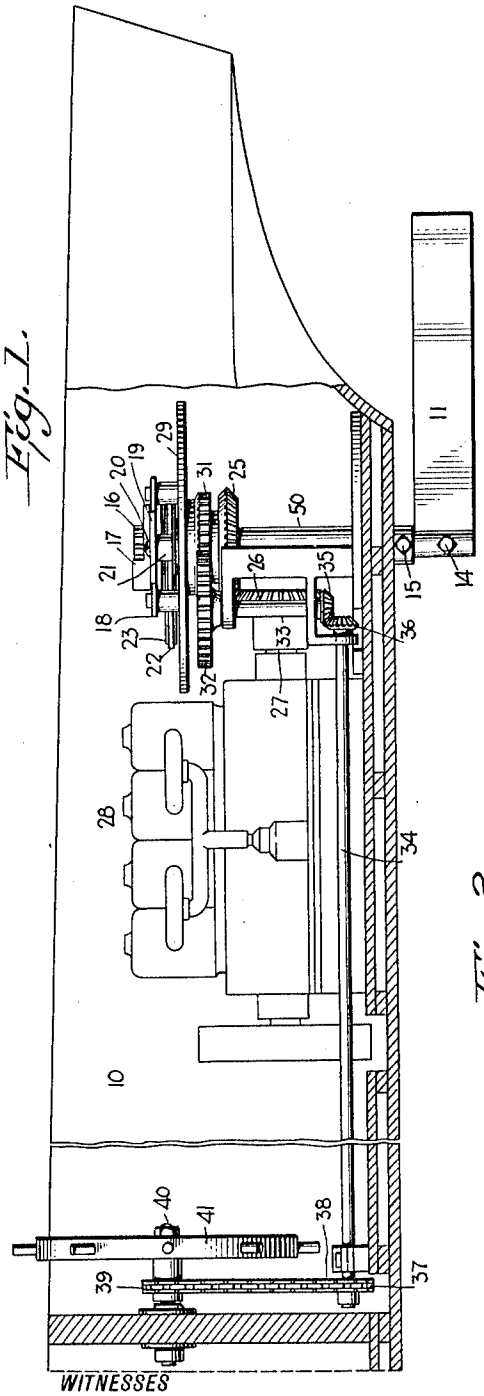
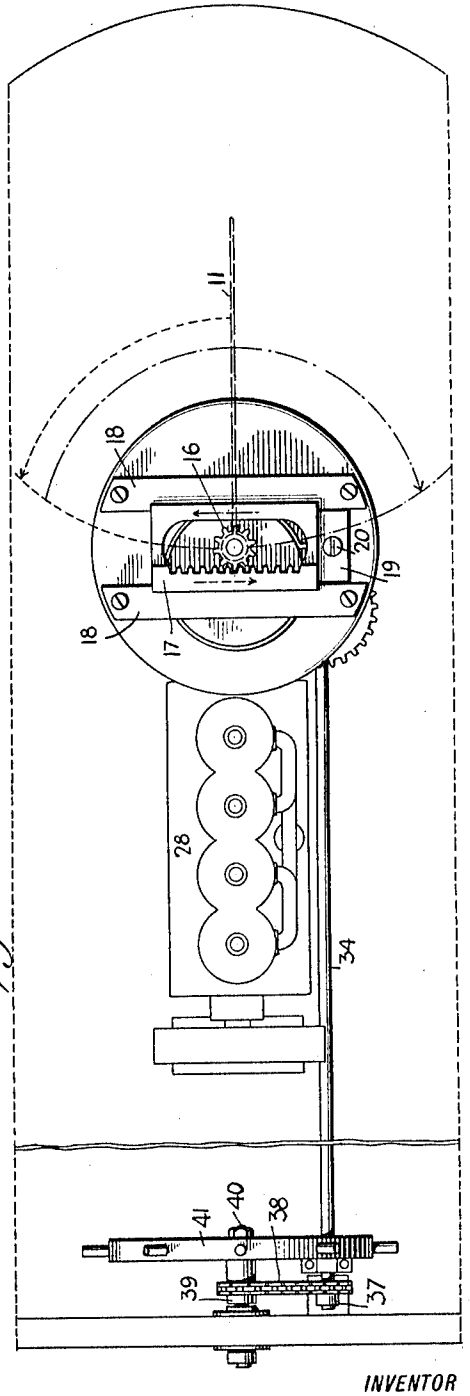


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

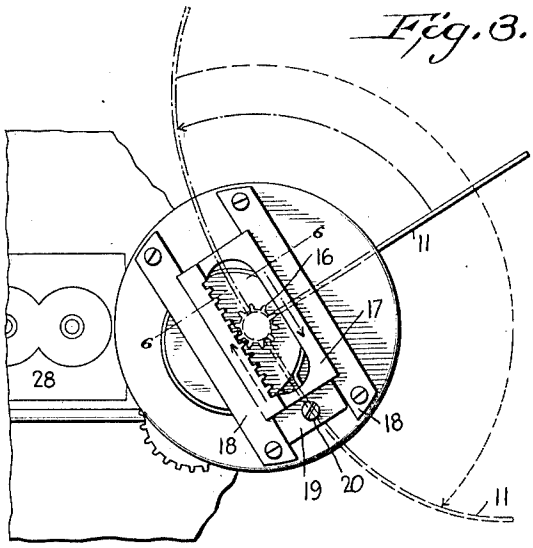


Fig. 5.

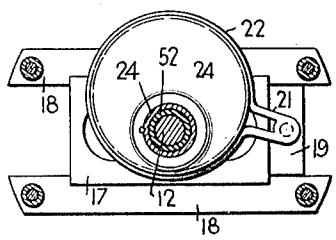


Fig. 6.

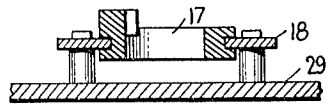


Fig. 4.

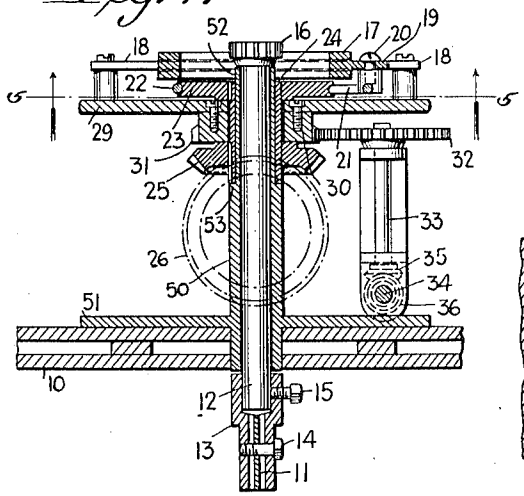
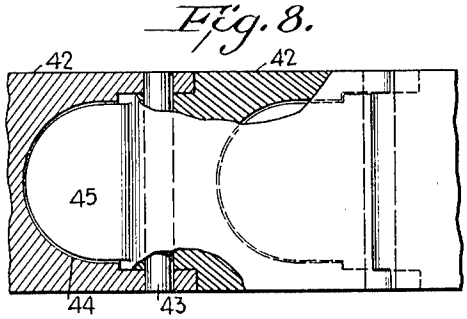
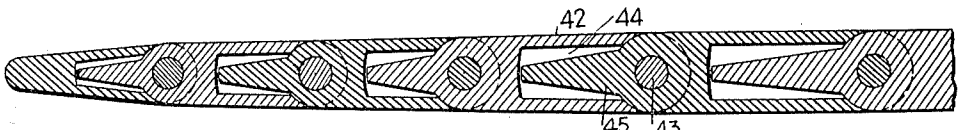


Fig. 8.





UNITED STATES PATENT OFFICE.

BINGHAM STEVENSON, OF LITTLE ROCK, ARKANSAS.

FISH-TAIL PROPELLER.

1,079,193. Specification of Letters Patent. Patented Nov. 18, 1913.

Application filed February 7, 1913. Serial No. 746,776.

To all whom it may concern:

Be it known that I, BINGHAM STEVENSON, a citizen of the United States, and a resident of Little Rock, in the county of Pulaski and State of Arkansas, have invented a new and Improved Fish-Tail Propeller, of which the following is a full, clear, and exact description.

My invention relates to fish-tail propellers in which a paddle is mounted to oscillate about a vertical axis. It is a design of my invention to provide an improved operating means for giving an oscillating motion to the paddle.

It is a further design of my invention to provide, in connection with fish-tail propellers, a means for turning the paddle about its axis of oscillation, to locate the angle of oscillation in different positions for propulsion in different directions whereby the propeller may be employed for steering, and for forward and backward propulsion.

It is also a design of my invention to improve in various particulars propellers of the indicated character, to the end that efficiency in operation may be promoted, as well as simplicity of adjustment and control.

The invention will be particularly explained in the specific description hereinafter to be given.

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

Figure 1 is a side elevation of a propeller and its actuating and controlling means constructed in accordance with my invention, the same being shown in connection with a marine vessel; Fig. 2 is a plan view; Fig. 3 is a fragmentary plan view showing the paddle in a different position from that indicated in Fig. 2; Fig. 4 is a transverse vertical section; Fig. 5 is an inverted sectional plan view on a plane corresponding with the line 5—5 of Fig. 4; Fig. 6 is a detail transverse section of the reciprocating rack for oscillating the shaft of the paddle; Fig. 7 is a horizontal sectional view of a modified form of the paddle; and Fig. 8 is a fragmentary sectional side elevation of the paddle shown in Fig. 7.

The propeller and its appurtenances may be employed in connection with any marine vessel 10. The paddle 11 may be in the form of a single flexible blade, and is mounted on a vertical shaft 12. The paddle may have a sleeve 13 secured thereto by a clamp bolt or set screw 14 or its equivalent, the sleeve being adapted to be removably secured to the shaft 12 by a set screw 15 or the like. The propeller shaft 12 is provided with means for oscillating it; for this purpose I make use of a pinion 16 secured to the said shaft, the pinion meshing with a reciprocating rack 17, which engages a suitable guide or guides 18. An arm 19 on the rack 17 is connected, as by a screw 20, to an arm 21 on the eccentric strap 22 of an eccentric 23. The eccentric 23 is keyed to a hollow shaft 24, surrounding the shaft 12 carrying the paddle and on said hollow shaft is a bevel pinion 25, in mesh with a pinion 26 on the drive shaft 27, adapted to be driven by any suitable power, an engine 28 being conventionally shown.

For mounting the vertical shaft 12 carrying the paddle, and the hollow shaft 24 surrounding the same, a vertical tubular sleeve bearing 50 is provided, having a base flange 51 for securing it in position. The shaft 12 extends through and has a bearing substantially throughout its length in the sleeve 50, and the hollow shaft 24 surrounds the reduced upper end 52 of the bearing 50, the lower end of the hollow shaft resting on a shoulder 53 at the lower end of the reduced portion 52 of the bearing sleeve.

In operation, it will be obvious that the turning of the shaft 27 will, through the medium of the pinions 25, 26, or any other equivalent driving connection, turn the hollow shaft 24, and with it the eccentric 23, so that the eccentric strap 22 will cause the rack bar 17 to be reciprocated in the guides 18, and thus the pinion 17 and vertical propeller shaft 12 will be oscillated and will give an oscillatory movement to the paddle 11, for propelling the vessel in the well known manner of fish-tail propellers.

In order that the propeller blade may be turned in its plane of operation, to dispose the blade in different angular positions relatively to the normal direction of propulsion, for the purpose of steering, the rack 17 and its guiding means 18 are mounted on a turntable 29, on the hub 30 of which a peripheral pinion 31 is formed or secured, meshing with which is a spur pinion 32 on a vertical shaft 33. The shaft 33 is adapted to be turned by a steering shaft 34, through suitable driving

connections such as bevel pinions 35, 36, and the shaft 34 is provided with a sprocket 37, over which a sprocket chain 38 runs, the chain running also over a sprocket 39 on the shaft 40 of the steering wheel 41, the arrangement being such that the turning of the wheel 41 in either direction will serve to turn the shaft 34 and shaft 33 geared thereto, and thus through the medium of the pinions 31, 32, the turntable 29 may be turned either to the right or to the left of the ship's axis, as for instance, to the position shown in Fig. 3, to locate the propeller blade so that its angle of oscillation will be at one side of the normal position and the paddle thus be utilized for steering.

Instead of giving the paddle the form of a single flexible blade 11, it may be made up of articulated links or sections, as illustrated in Figs. 7 and 8. The individual sections 42 are pivotally linked together by vertical pins 43, and each section is recessed as at 44 at one end, in which recess the tapered terminal 45 of an adjacent section is received. The joints between the link sections are not water-tight, so that water may enter the recesses 44 to provide a hydraulic check to avoid slamming and knocking in the turning of the sections when the paddle is oscillated. The tapered ends 45 of adjacent sections may oscillate in the recesses 44, so that in the oscillation of the paddle the sections will assume angular positions, giving a result similar to that of the flexible paddle 11, which will assume a curved form when oscillated, as indicated in dotted lines in Fig. 3.

The described construction affords a practical means for carrying my invention into effect, and I would state in conclusion that I do not limit myself strictly to the mechanical details herein illustrated, since manifestly the same can be considerably varied without departure from the spirit of the invention.

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

1. A fish-tail propeller comprising a paddle, a shaft on which the paddle is mounted, a pinion on said shaft, a reciprocating rack in mesh with the pinion, a turntable on which the rack has guided movement, a hollow shaft surrounding the first shaft, to which hollow shaft the turntable is secured, means for reciprocating the rack, and means for turning the hollow shaft and its turntable, the turning of said table serving to turn the rack and the first mentioned shaft with the table.

2. In combination with a fish-tail propeller, a shaft on which the propeller is mounted, a pinion on said shaft, a reciprocating rack bar in mesh with said pinion, a turntable having a guide for said rack bar, a hollow shaft on which said table is secured, said hollow shaft surrounding the first mentioned shaft, a drive shaft, driving connections between the drive shaft and the said hollow shaft, a pinion in fixed relation to the turntable, a second pinion in mesh with the pinion on the turntable, a shaft bearing said second pinion, a steering shaft having means to turn the same, and driving connections between the steering shaft and the shaft bearing said second pinion.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BINGHAM STEVENSON.

Witnesses:
E. F. PACE,
M. C. MARTIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."