No. 858,010. PATENTED JUNE 25, 1907.

C. A. MOLINE.

PROPELLER FOR BOATS.

APPLICATION FILED JUNE 2, 1906.

2 SHEETS—SHEET 1.

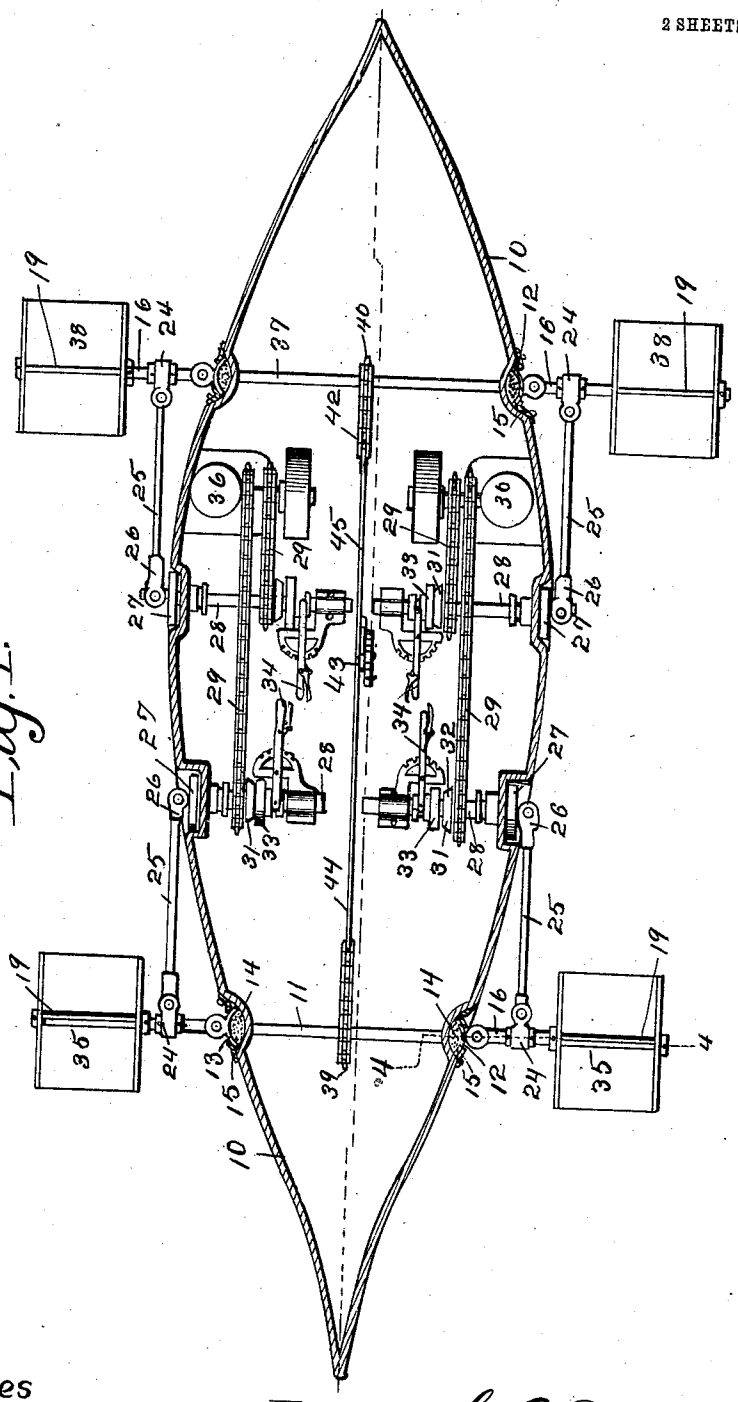

Fig. 1.

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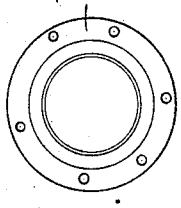
2 SHEETS—SHEET 2.

Fig. 6.



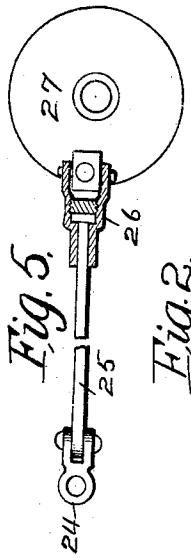




Fig. 5.

Fig. 2.

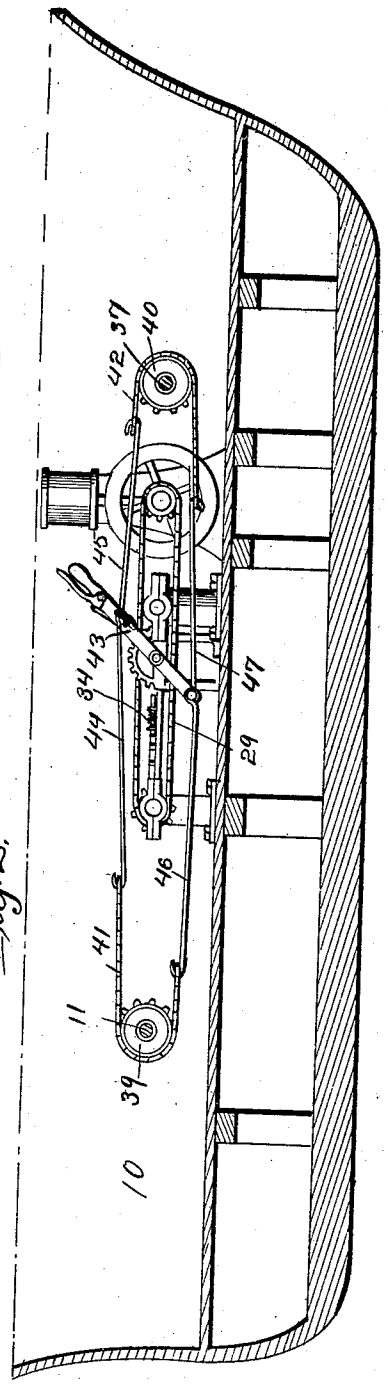



Fig. 4.

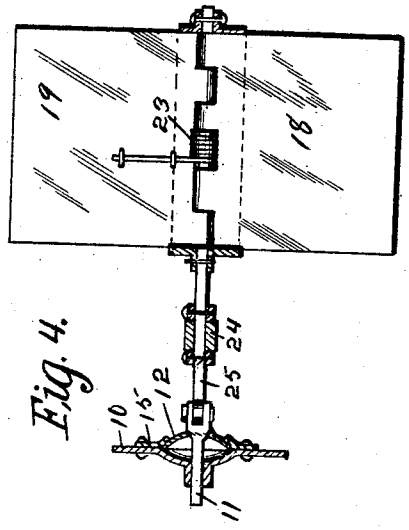
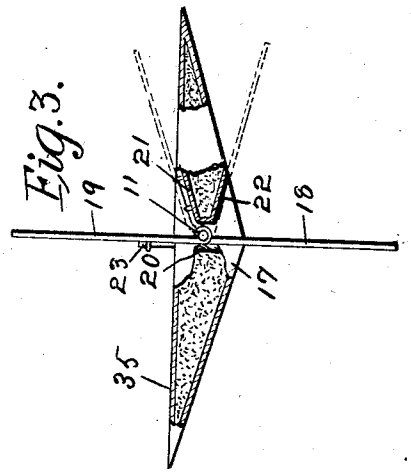



Fig. 3.




Witnesses

A. G. Hague

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# UNITED STATES PATENT OFFICE.

CHARLES A. MOLINE, OF BANCROFT, IOWA.

## PROPELLER FOR BOATS.

No. 858,010. Specification of Letters Patent. Patented June 25, 1907.

Application filed June 2, 1906. Serial No. 320,202.

*To all whom it may concern:*

Be it known that I, CHARLES A. MOLINE, a citizen of the United States, residing at Bancroft, in the county of Kossuth and State of Iowa, have invented a certain new and useful Propeller for Boats, of which the following is a specification.

The objects of my invention are to provide a propeller for boats which can be easily and readily attached to boats of various sizes and shapes, and in which the propeller blades afford a minimum amount of resistance against the water in making its forward stroke, and a maximum amount of resistance in making its return stroke.

A further object is to provide propellers which can be easily reversed from the boat to reverse the direction in which the boat is to be driven.

A further object is to provide propellers which are designed to be operated at the sides of the boat and at opposite ends of it and which are capable of being swung to a position adjacent to the sides by the operator, so as to enable him to approach a wharf or boat-landing easily.

A further object is to provide propellers which are easily and readily operated by any of the ordinary driving mechanism, such as gasolene, electrical or steam engines.

My invention consists in certain details in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal, sectional view of a boat, showing a plan view of the working parts of my device. Fig. 2 is a longitudinal, vertical, sectional view of the device. Fig. 3 is a sectional view of the support for the propeller blades, showing these blades in elevation and showing in dotted lines their closed position. Fig. 4 is a sectional view cut on the line 4—4 of Fig. 1, showing the rear of the extended propeller blades. Fig. 5 is a detail view of one of the plates which are attached to the driving shafts for operating the propeller and shows the connecting rod by which the propeller shafts are oscillated, and Fig. 6 shows in detail one of the plates for securing the packing boxes through which the propeller shafts extend in position relative to the sides of the boat.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate the lower portion of an ordinary boat. Extending transversely of the rear end of the boat is a shaft 11 which is rotatably mounted in the boxings 12 and 13 at each side of it in each of which the packing 14 is placed to prevent the water getting into the boat through the shaft opening. I have provided a plate 15 for each of the boxings 12 and 13 for securing these in position relative to the side of the boat, as shown clearly in Fig. 1 of the drawings. Pivotally attached to one end of the shaft 11 is a propeller supporting shaft 16, having the wedge shaped support 17 rigidly secured to its outer end. This support is filled with a buoyant material to support the propeller in the water. Pivotally attached to the metal portion of the wedge shaped support 17 and loosely mounted on the propeller supporting shaft 16 are the propeller blades 18 and 19 which are limited in their open movement by the brace 20 in the propeller support. The forward interior portion of the propeller support is tapered at 21 and 22 to allow the propeller blades to swing rearwardly, into the position shown in dotted lines in Fig. 3 of the drawings on the forward stroke of the propeller so as to afford the least possible resistance when making this stroke.

On the opposite end of the shaft 11 I have provided a coil spring 23 which encircles the propeller supporting shaft 16 which is inside the propeller blades 18 and 19, and which is attached to the blade 19, so as to normally draw this blade to an open position when the propeller is making its rear stroke. The lower blade 18 will fall to its extended position by the force of the gravity and for that reason there is no need of the spring for this purpose on the blade 18. Rotatably mounted on the propeller supporting shaft 16 and between the propeller shaft 11 and the propeller support 17 is a sleeve 24 having pivotally secured to its forward portion the connecting rod 25, which rod is rotatably mounted at its other end in the bearing 26, which bearing is secured to the outer periphery of the plate 27, said plate being securely fixed on the outer end of the driving shaft 28, which driving shaft is rotatably mounted in the lower portion of the boat and extends through one side of it. This shaft 28 is driven by the ordinary sprocket chain 29

from the engine 30 in the bolt. The sprocket wheel 31, which is rotatably mounted in the shaft 28, has on its inner face a beveled friction wheel 32 which is designed to coact with the friction wheel 33 secured to the shaft 28, for the purpose of driving said shaft when the friction wheels are in contact with each other and are maintained in contact by means of the lever 34 secured to the boat. As the shaft 28 is rotated, the connecting rod 25 will be moved forwardly and rearwardly, and will cause the propeller supporting shaft 16 to be oscillated forwardly and rearwardly, and thus cause the propeller blades to close and open; that is, swing from the position shown in dotted lines in Fig. 3 to the position shown in plain lines in said figure, and thus cause the water to offer the greatest possible resistance against the extended blades and a consequent rapid propulsion of the boat.

Secured to the other end of the shaft 11 is a propelling mechanism 35 similar in construction to the one already described, and as this is driven from an engine 36 through a mechanism like the one above described in every respect, a further description is deemed unnecessary. At the forward end of the boat I have provided a shaft 37 which has at each end of it and outside of the sides of the boat a propelling mechanism 38 which are driven from the engines 30 and 36 respectively in exactly the same way as the one already described, and a further description of these are deemed unnecessary as they all work together to accomplish the same result.

Attached to the central portion of the shaft 11 is a sprocket wheel 39. Attached to the shaft 37 is a sprocket 40. Passing over and under the sprocket wheel 39 is a sprocket chain 41. Passing over it and under the sprocket wheel 40 is a sprocket chain 42. Pivotally attached to a support midway between the shafts 11 and 37 is a lever 43, to which lever I have pivotally attached the rod 44, which rod is secured at its other end to the chain 41. Pivotally attached to the opposite side of the lever 43 from the rod 44 is a rod 45 which is secured to the upper end of the sprocket chain 42 at its other end. Pivotally attached to the lower end of the lever 43 at one end and at its other end to the lower end of the sprocket chain 41 is a rod 46.

Pivotally attached at one end to the lower end of the lever 43 and at its other end to the lower portion of the sprocket chain 42 is a rod 47, said rods and said sprocket chains being so arranged in connection with said lever 43 that when the lever is moved in one direction, the shafts 11 and 37 will be rotated in one direction, and when the lever is moved in the opposite direction, the shafts will be rotated in an opposite direction. By the operation of this lever the propeller supports are inverted and the operation of the propeller blades is reversed, thus reversing the direction in which the boat will be propelled. In turning these shafts to reverse the operation of the propellers, the shafts 11 and 37 must be given a half revolution so as to completely invert the propeller supports. When it is desired to approach a dock, the shafts 11 and 37 are given a quarter turn and the driving mechanisms are thrown out of operation at the proper time to allow the momentum already acquired to carry the boat to the dock, and as soon as this quarter turn has been made, the propeller supporting shafts will be allowed to swing on their pivots and the connecting rods 25 will be allowed to rotate in their bearings 26, and these propeller shafts and the supports mounted upon them will be allowed to fall by gravity to a position adjacent to the sides of the boat as the buoyant material in the propellers is only sufficient to partially support these propellers and the ends of the shafts on which they are mounted.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States, therefor is—

1. In a device of the class described, a series of propellers, each comprising a propeller supporting shaft, propeller blades secured to said shaft and capable of opening and closing as the propeller shaft is swung forwardly and rearwardly, a buoyant support incasing the inner portion of the propeller blades for partially supporting them and the outer end of the propeller supporting shafts, and means for swinging the propeller shaft forwardly and rearwardly.

2. In a device of the class described, a series of propellers, each comprising a propeller supporting shaft, propeller blades secured to said shaft and capable of opening and closing as the propeller shaft is swung forwardly and rearwardly, a buoyant support incasing the inner portion of the propeller blades for partially supporting them and the outer end of the propeller supporting shafts, means for swinging the propeller shaft forwardly and rearwardly, and means for limiting the opening and closing movement of the propeller blades.

3. In a device of the class described, a series of propellers, each comprising a propeller supporting shaft, propeller blades secured to said shaft and capable of opening and closing as the propeller shaft is swung forwardly and rearwardly, a buoyant support incasing the inner portion of the propeller blades for partially supporting them and the outer end of the propeller supporting shafts, means for swinging the propeller shaft forwardly and rearwardly, and means for inverting the support for the propeller blades and the outer end of the propeller supporting shaft for reversing the operation of the blades.

4. In a device of the class described, a series of propellers, each comprising a pivotally mounted propeller supporting shaft, propeller blades secured to said shaft and capable of opening and closing after the propeller shaft is swung forwardly and rearwardly, a buoyant support for the propeller blades, means for swinging the propeller shaft forwardly and rearwardly, and means for turning the propeller shaft a partial turn for allowing it to swing downwardly.

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Witnesses:
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