

(No Model.)

F. D. WHIPP.
VIBRATING PROPELLER.

No. 405,813.

Patented June 25, 1889.

Fig. 1.

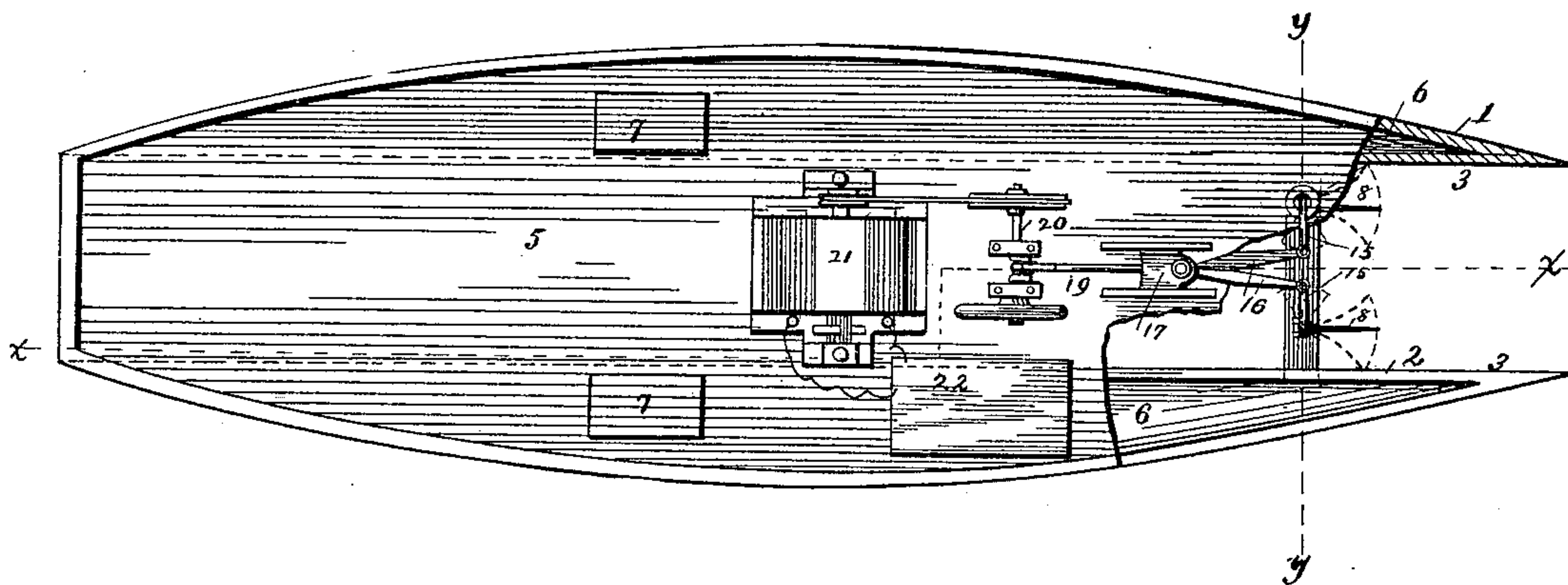


Fig. 2.

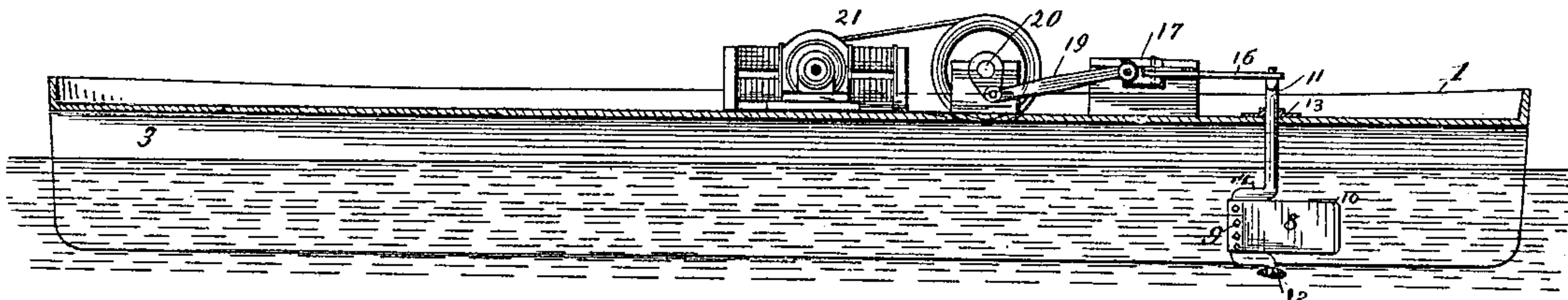


Fig. 3.

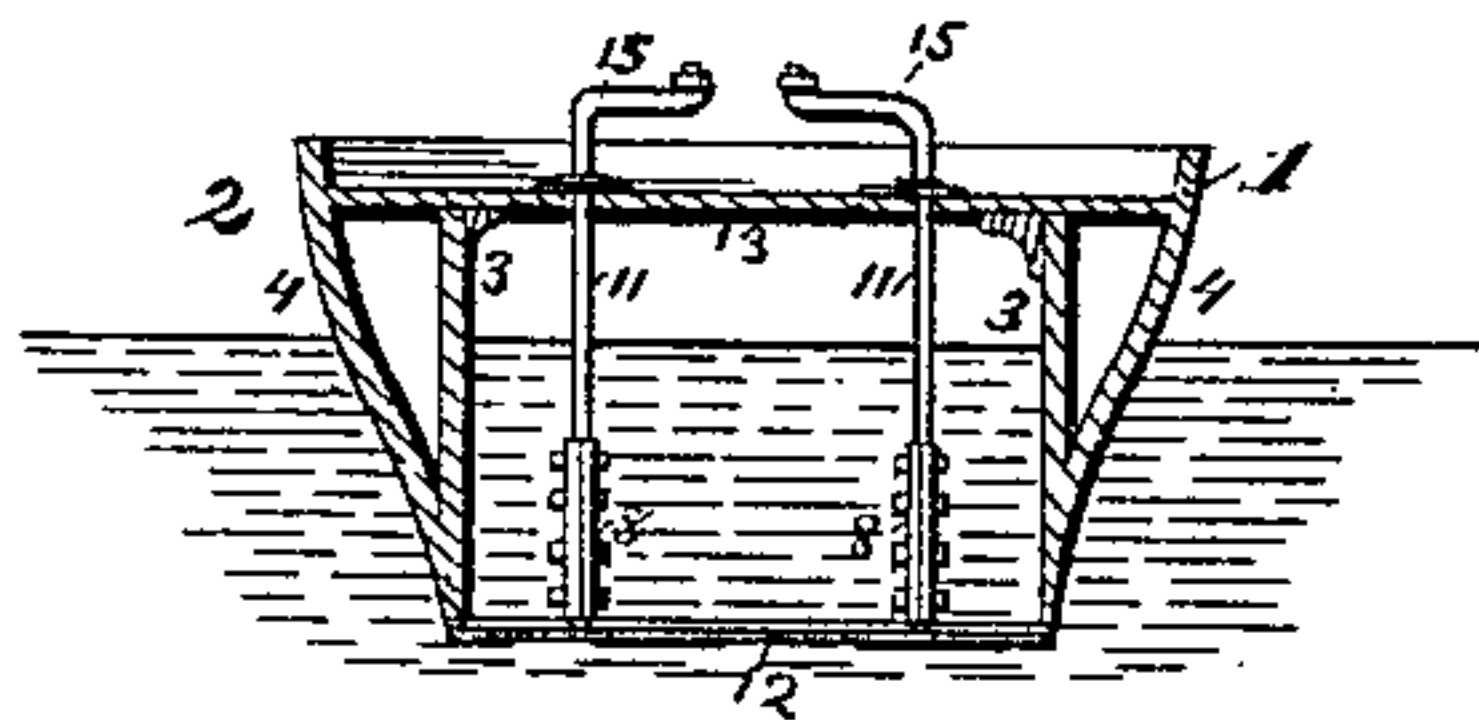


Fig. 4.

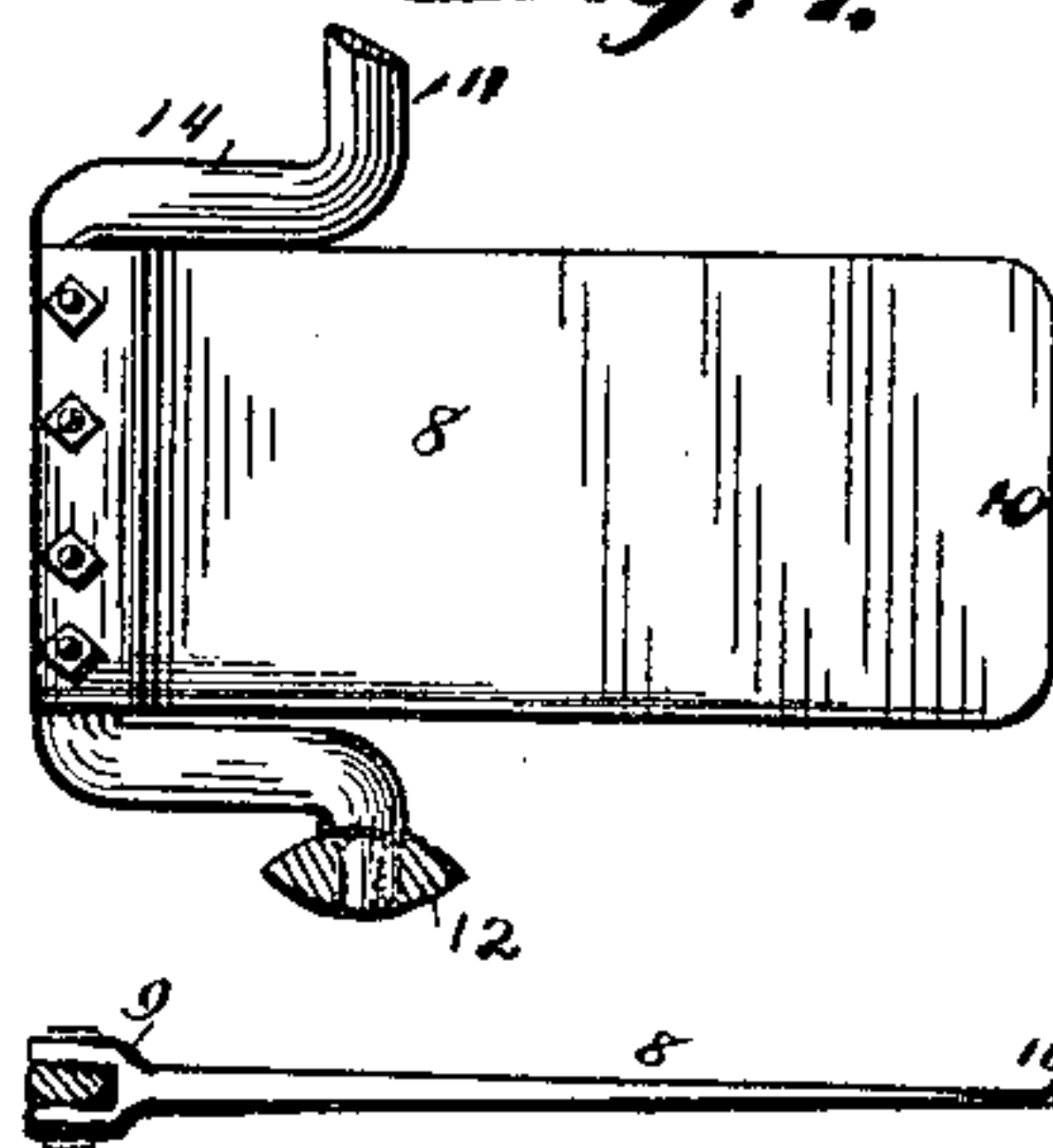


Fig. 5.

Witnesses.
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UNITED STATES PATENT OFFICE.

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VIBRATING PROPELLER.

SPECIFICATION forming part of Letters Patent No. 405,813, dated June 25, 1889.

Application filed June 6, 1888. Serial No. 276,217. (No model.)

To all whom it may concern:

Be it known that I, FRANK D. WHIPP, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Vibrating Propellers; and I 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, My invention relates to improvements in vibrating propellers; and it consists in the means for propelling the same, all as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the propeller with a portion of the platform or deck broken away to disclose the propelling mechanism beneath. Fig. 2 is a longitudinal vertical section on line *x x*, Fig. 1. Fig. 3 is a cross-section on line *y y*, Fig. 1. Fig. 4 is a detached side view of a propeller-blade and its crank-shaft, and Fig. 5 an edge view of the blade and section of its shaft.

I am of course aware that vibrating propellers are not broadly new, and one is shown here mainly to illustrate my propelling-blades and to form the basis for combination claims. In this construction I employ two sections or floats 1 and 2, which respectively resemble half a boat of corresponding size when built in the usual way—that is to say, if the two sections were brought together they would form in appearance a boat of common construction in length and width. These floats or sections are each provided with straight plain inner sides 3, extending their entire length and depth, and round or curved outer sides 4, fashioned in the usual manner to give buoyancy, lightness of draft, and the like. These floats are covered over by a deck or platform 5, which may extend entirely across both floats, as here shown, or only to the inner edges, the manner of covering or connecting the sections not being material. If the platform is extended clear across both floats, air-tight chambers 6 are formed in each float, with trap-doors 7, through which they are entered, and in which it is convenient to store provisions and other articles. By this construction of the floats I get all the advantages of safety in turbulent waters

and in storms which the catamaran is known to afford over ordinary vessels, as well as greatly increased deck area, while at the same time the resistance to the propulsion of the vessel is not increased over that of a boat of corresponding size made in the usual way. This provides a vessel for excursion parties and the like uses where safety and room are leading considerations, which is incomparable in these particulars. The fact that the inner sides are straight and set in relation to each other, as shown, renders it unnecessary to have a keel or center-board, the said sides serving all the purposes of these parts and affording sufficient side bearings to insure steady sailing and easy guiding of the vessel in all conditions of water.

The real feature of novelty is found in the propelling-blades 8 and the combination therewith. These blades are made, preferably, of sheet-steel, though other metal or suitable material may be used, and have broad sides which taper gradually from the head 9 to the extremity 10, and are of such thickness as to be flexible practically throughout their length, the flexibility, of course, increasing with the diminishing thickness of the blade. An analogy in nature and which this construction is designed to resemble as nearly as possible is found in a fish's tail. As the fish propels itself by means of its tail, so it is designed to employ these blades to propel the boat. Now, to give the blade the movement necessary to get this result, I employ a crank-shaft 11, supported in cross-bars 12 and 13, extending from float to float and provided with a crank 14 near its lower end, and to this crank the head of the blade is secured by any suitable means—as, for example, by bolts and nuts passing through the crank and blade. This construction enables me to impart to the heads of the blades the quick lateral movement required to bring the blades into action, and by keeping up the vibrations back and forth, acting on the water right and left alternately, the blades are forced against the water in such a way as to necessarily impel the boat forward while they describe a sinuous course through the water as the inevitable result of their peculiar movement. The vibrations or oscillations of the crank-shaft are effected through arms 15 on the shafts, and con-

5 nected by links 16 with sliding block 17, operated by pitman 19 from drive-shaft 20. An electric motor 21 and battery 22 are shown to drive this mechanism; but clearly the nature
10 of the power employed and the particular method of communicating the power to the crank-axles are not material. Any means of power and any particular method of connection which will oscillate the crank-shafts on
15 their axis will answer my purpose.

It has been observed that the blades are set between the sides of the floats, and one or more such blades or sets of blades may be employed, and the precise point of location is
20 not important; but it will be seen that, being located between the vertical sides of the floats and operating upon the water between said sides, the sides form a backing or resistance to the stroke of the blades which is considerably greater than the water alone without
25 such backing would exert, and this tends to give much greater effect to the stroke and develop more power in each stroke than could occur if the resistance to the movement of the water were not there. It is, in other words,
30 more like pushing or bearing against a fixed object as compared with pushing against a yielding object. I am thus enabled to increase the power of the propelling-blades by locating them between the sides of the floats, which is a material advantage in their combination. The cranks might of course be set in the opposite direction on the shaft, and the form and size of the blades might be varied,
35 without departing from the spirit of the invention. The blades might be arranged horizontally instead of vertically in the water, but they would not be as even and effective in their stroke.

The exact manner shown for supporting the crank-shaft need not necessarily be adopted, as, for example, brackets might be projected from the sides of the floats to furnish the necessary bearings, and a different arrangement or construction of crank could be used to operate the blades, the spirit of this part of the invention being in a sharp positive oscillating movement of the head of the spring-blade, which imparts action to the entire blade.

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

1. In a propeller, a shaft adapted to be oscillated axially and having a crank formed therein, with a flexible propeller-blade attached to the crank, substantially as set forth.
2. In a propeller, a shaft to operate the blade, having a crank formed to extend forward of the axis of the shaft, and a blade rigidly attached to said crank, substantially as set forth.
3. The combination of two floats having straight inner sides opposite each other, with a propelling-blade between the floats, and a shaft for operating the blade, having a crank to which the blade is attached, substantially as set forth.
4. The combination of two floats, a shaft set vertically between the floats, and a flexible blade attached rigidly to a crank on said shaft, which extends forward of the axis of the shaft, substantially as set forth.

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Witnesses:

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