

No. 815,738.

PATENTED MAR. 20, 1906.

H. B. PROSSER.  
PROPELLER FOR BOATS.  
APPLICATION FILED DEC. 5, 1904.

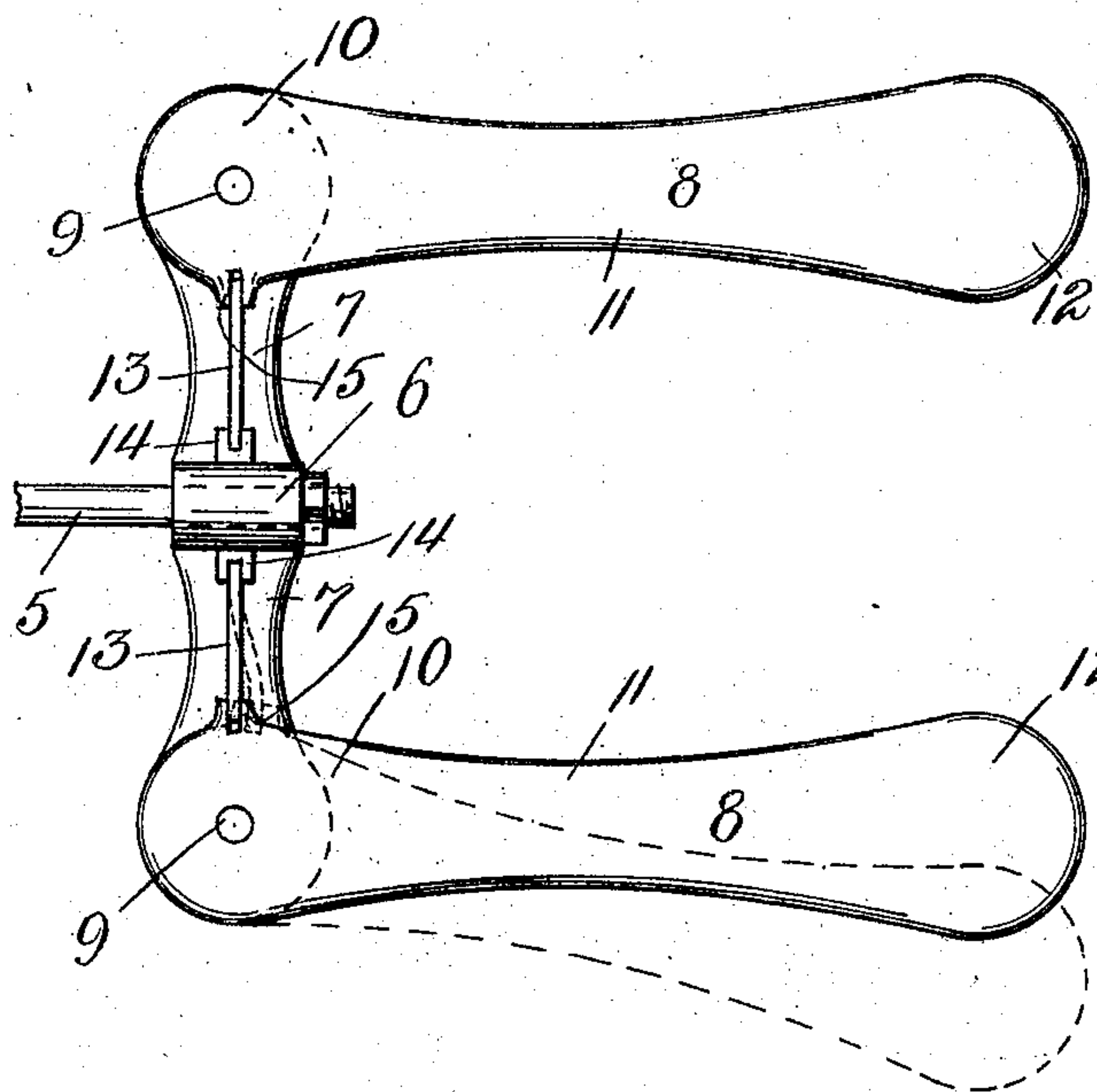


Fig. 1

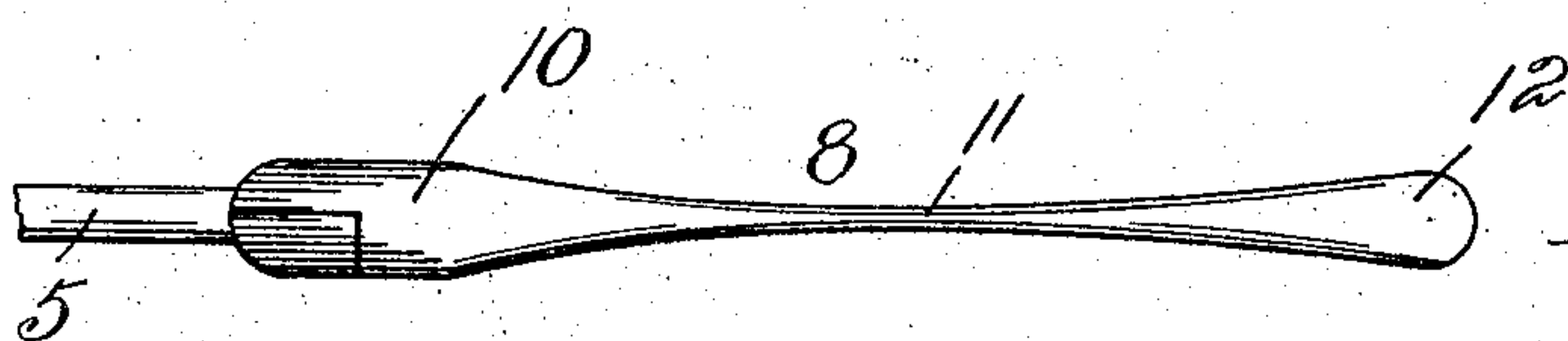


Fig. 2

Fig. 4.

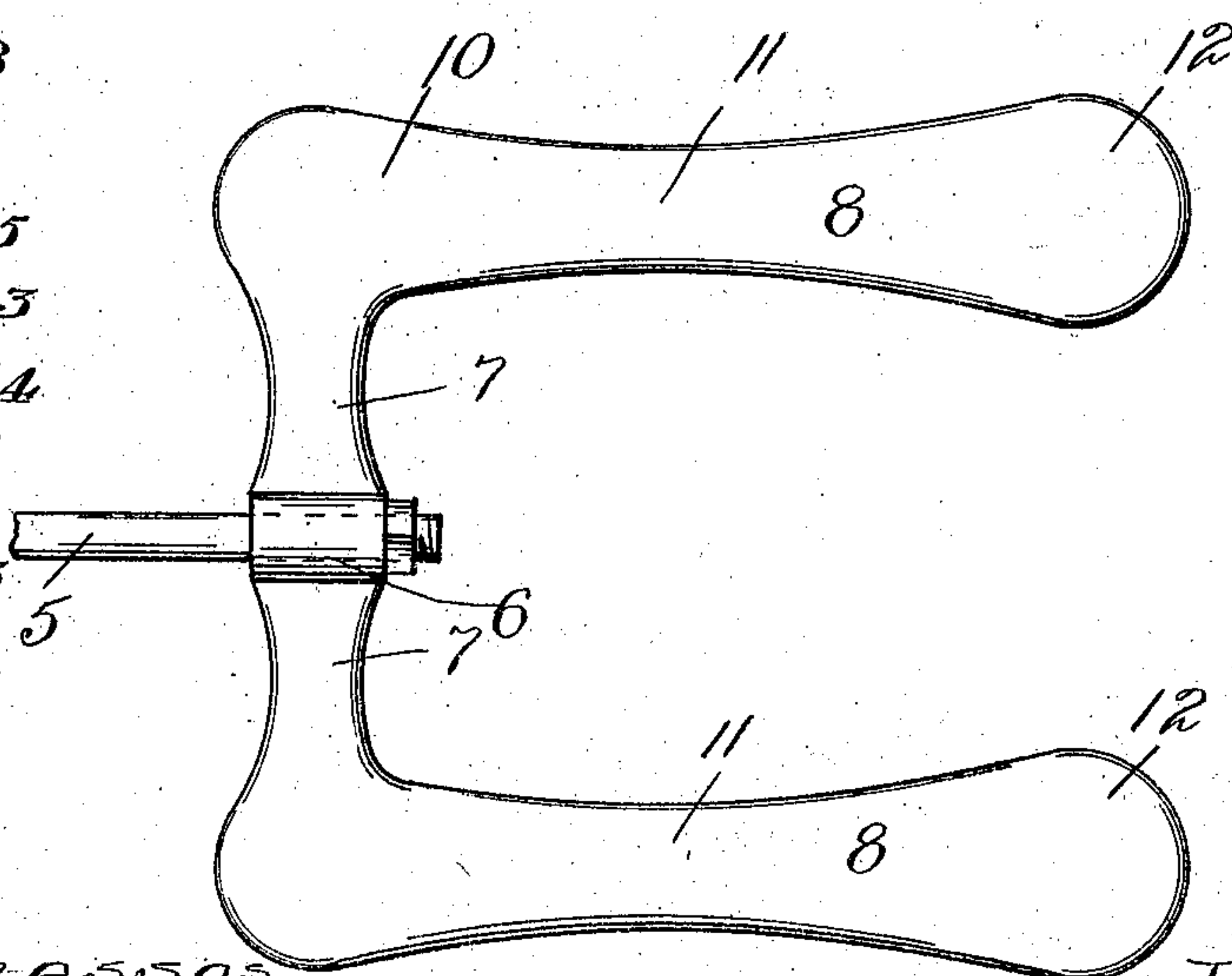
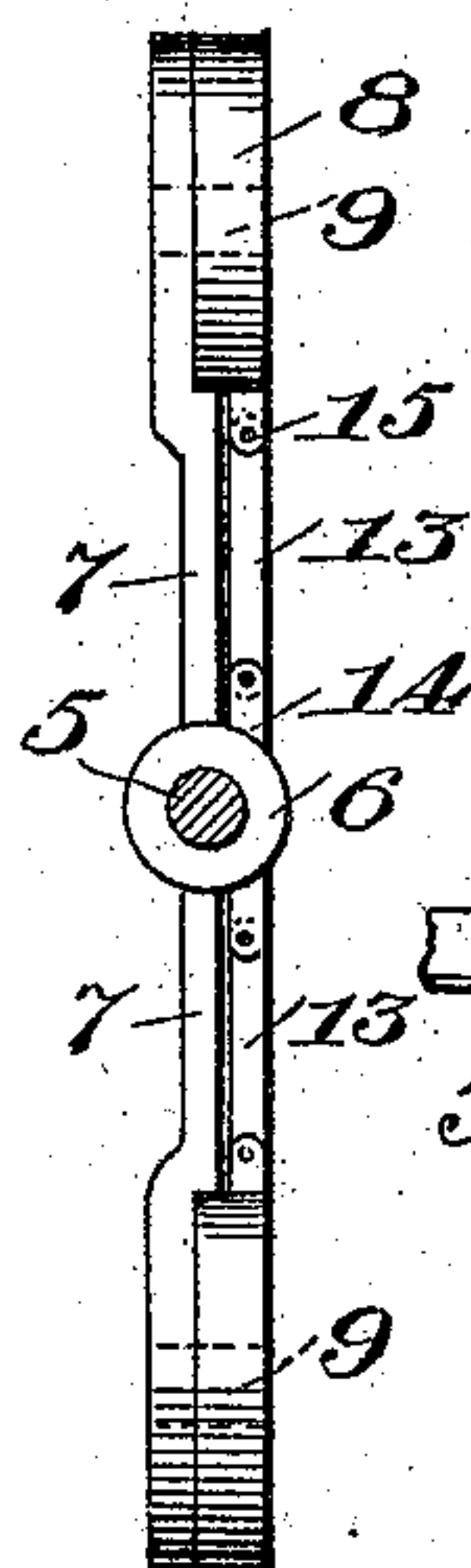


Fig. 3

Witnesses  
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# UNITED STATES PATENT OFFICE.

HENRY B. PROSSER, OF CHICAGO, ILLINOIS.

## PROPELLER FOR BOATS.

No. 815,738.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed December 5, 1904. Serial No. 235,571.

*To all whom it may concern:*

Be it known that I, HENRY B. PROSSER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Propellers for Boats; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in propellers for boats, and has for a salient object to provide a propeller adapted when properly actuated to propel the vessel where-to it is applied at maximum speed with the minimum expenditure of energy.

Other and more specific objects may best be gathered from the following description of my propeller and its use, taken in conjunction with the accompanying drawings, wherein—

Figure 1 is a side view of a propeller constructed in accordance with my invention. Fig. 2 is an edge view of the propeller, and Fig. 3 is a side elevation of a modified construction embodying features of my invention. Fig. 4 is an end view of the propeller shown in Fig. 1.

Throughout the drawings like numerals of reference refer always to like parts.

In the drawings, 5 indicates the propeller-shaft, which, it will be understood, extends into the body of the boat wherewith the propeller is associated and is connected with a suitable engine for giving it the proper movement to secure the most effective operation of the propeller, as hereinafter described. The propeller may be mounted upon said shaft in any preferred way, the propeller being here shown as provided with a hub 6, directly secured to the shaft 5.

7 7 indicate arms projecting diametrically from the hub 6 and at their outer ends affording support to the propeller-blades 8 8. The blades 8 8 project rearwardly from their supporting-arms with reference to the direction of propulsion, the blades in the form of propeller shown in Fig. 3 being permanently arranged in substantial parallelism and in the form of device shown in Figs. 1 and 2 arranged when at rest in substantial parallelism, but movable from such parallel relation, as hereinafter described.

In the form of propeller shown in Fig. 3 it will be seen that each blade 8 effects a permanent integral joint with its supporting-arm 7,

while in the form of my invention shown in Figs. 1 and 2 each blade 8 is pivotally secured to its supporting-arm 7, as by a pivot-pin 9. In both constructions, however, the blade 8 is preferably shaped as shown in the drawings, having a relatively thick wide butt portion 10 adjacent the point of connection with the supporting-arm 7, a relatively thin and somewhat narrow mid-portion 11, thin enough to be flexible and elastic without too great a sacrifice of strength, and an end portion or extremity 12 of heavier construction than the mid portion, preferably both wider and thicker than said mid-portion and relatively rigid.

In the embodiment of my invention shown in Fig. 1 means are provided for yieldingly maintaining the blades 8 8 in approximate parallelism, said yielding means being adapted to permit the blades to fly out or separate somewhat from their normal positions when rotated, after the fashion of governor-balls. Specifically, 13 indicates a spring, preferably a leaf-spring, interposed between studs 14 14, secured to some part of the blade-supporting structure, such as the hub 6, and the confronting studs 15 15, formed on or carried by the blade 8. The spring is preferably arranged in alinement with the pivot 9 at approximately a right angle with reference to the axis of the blade 8. It will be understood that both blades are equipped alike with springs. It will now be apparent that if the shaft 5 of the device shown in Figs. 1 and 2 be rotated or oscillated with sufficient rapidity centrifugal effect will cause the heavy ends 12 12 of the propeller-blades to fly outward, as indicated in dotted lines in Fig. 1, with reference to one of the blades, such movement of the blades bending their associated springs 13, as indicated in dotted lines, and thereby putting the springs under tension, so that when the propeller comes to rest the springs will act to restore the blades to their normal positions of approximate parallelism.

In the operation of my device the shaft 5 is given an oscillatory movement, being turned, preferably, through approximately half a revolution in one direction and then back again in the other direction. Referring now to the embodiment of my invention shown in Fig. 3, it will be understood that this rapid oscillation of the propeller causes the following action of the blade: As the shaft is turned in one direction each blade, the width of which is opposed to the water, resists movement and bends or flexes at the elastic



mid-portion 11, so that the median line of the blade does not stand in parallelism to the axis of motion of the boat, but at an angle to said axis of motion such that it produces a propelling effect. When now the blade reaches its limit of movement in its aforesaid direction and the shaft slows down for reversal of direction of rotary movement, the blade springs back to straight or normal position by virtue of the resilience of its mid-portion 11, giving the water a sharp flirt. This action is aided by the weight of the extreme portion 12 of the blade, which by virtue of its relative weight acquires momentum in its traverse through the water and tends to continue its initial movement when the shaft 5 is reversed in direction of movement. The action of the blade upon the water is further made effective by the fact that the extreme portion 12 of the blade is its widest portion and is so thickened as to be practically rigid and unbending under the opposing forces of propulsion by the shaft and resistance by the water. It is noteworthy that this flirting action of the extremity of the blade is analogous to the action of the tail of a fish, the reversal of direction of movement of a fish's tail being made with such rapidity that the water is given at the end of each stroke a quick flirt, which appears to be very effective in propelling the fish at high speed.

In the embodiment of my invention shown in Figs. 1 and 2 it will be apparent that the action of each individual blade is the same as I have just described; but in addition it will be seen that the blades will automatically adjust themselves during each semi-oscillation of stroke of the shaft 5 toward the extended portion, wherein they exert a more effective leverage upon the water than in their normal position. It will be apparent that the blades 8 under these conditions will adjust themselves to approximately the proper position for the most effective action in propelling the boat, the propeller acting as a sort of governor for the engine and regulating the position of its blades in harmony with the power of the engine. Thus if the engine speeds up too high the blades swinging out have such a leverage that the load upon the engine is too great and the engine speed is reduced to such a point that it can well carry the load.

While I have herein described in some de-

tail specific embodiments of my invention, I do not desire to be understood as limiting myself to the details of shape and construction further than as specified in the claims.

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

1. A propeller for boats comprising a support, blades projecting rearwardly from the support, each blade having a relatively thin elastic mid-portion, and a weighted portion in rear of said mid-portion.

2. A propeller for a boat comprising a support, and blades projecting rearwardly from said support, each of said blades comprising a relatively narrow, thin mid-portion of elastic material and a relatively rigid and heavy portion in rear of said mid-portion.

3. A propeller for boats comprising a support, and a plurality of blades projecting rearwardly from said support, each of said blades comprising an elastic, relatively thin portion 11, and a relatively wide, rigid, heavy portion 12.

4. In combination with a propeller-shaft, a propeller comprising a support having radial arms, laterally-flexible blades extending rearward from said arms and presenting their edges toward the axial line of the shaft, said blades being pivoted to said arms for edgewise oscillation, and yielding means for normally retaining said blades in substantial parallelism yieldable to permit their edgewise movement in divergent positions.

5. A propeller for boats, comprising a support, including arms 7 7, blades secured to the extremity of said arms and projecting rearwardly from the support, each of said blades comprising a relatively elastic, thin mid-portion and a weighted portion in rear of said mid-portion, and each of said blades being pivoted to its arm 7 for edgewise movement, and springs 13 normally maintaining said blades in approximately parallel positions and yieldable to permit said blades to move edgewise to divergent position.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY B. PROSSER

In presence of—

GEO. T. MAY, Jr.,  
MARY F. ALLEN.