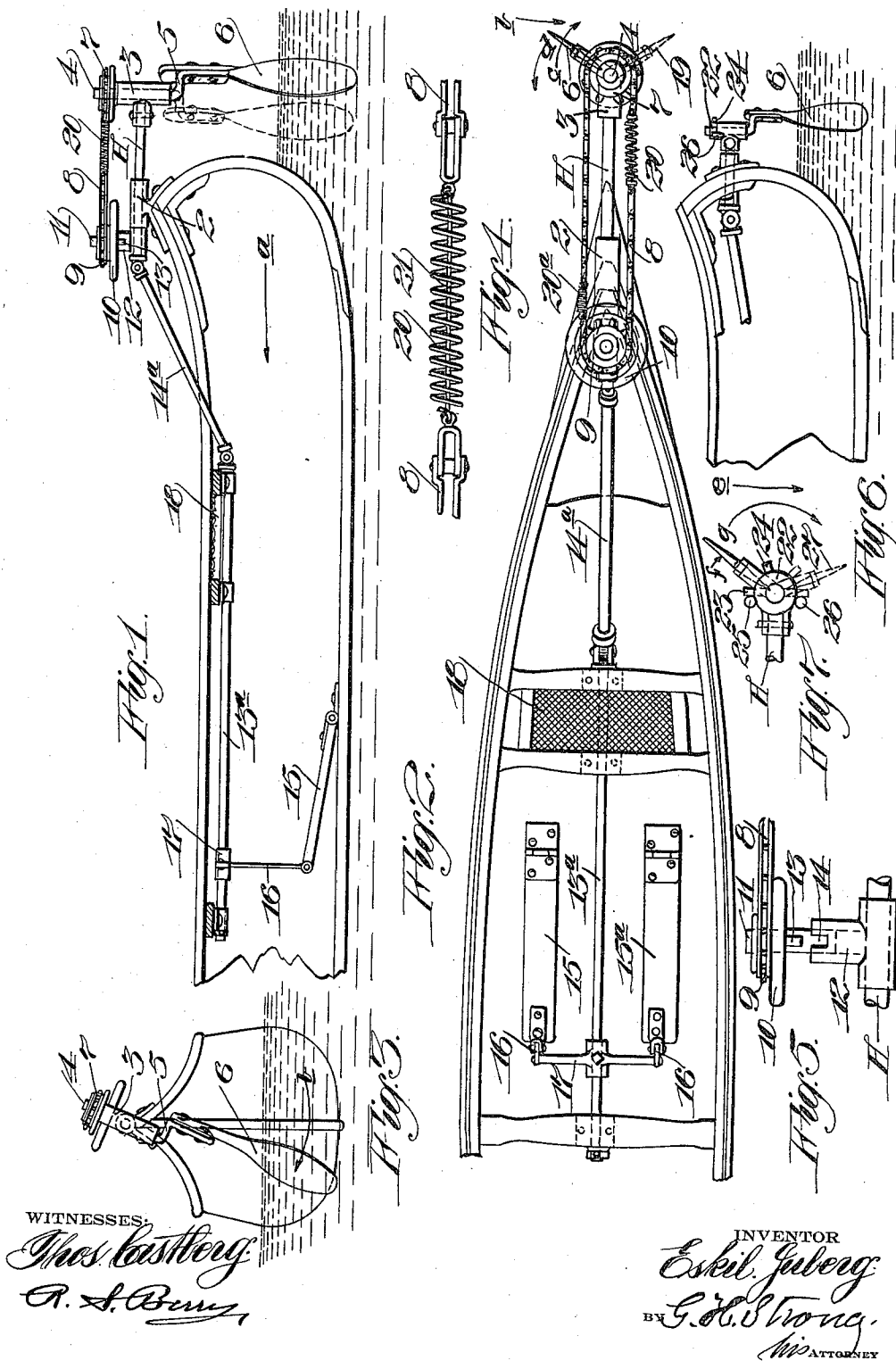


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SCULL PROPELLER.
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ESKIL JUBERG, OF SAN FRANCISCO, CALIFORNIA.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ESKIL JUBERG, a subject of the King of Sweden, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Scull-Propellers, of which the following is a specification.

This invention relates to an oscillating boat propeller.

The object of this invention is to provide a simple, substantial, and efficient oscillating propeller or sculling mechanism, which is so constructed that it may be quickly and easily installed in any form of boat.

Another object of the invention is to provide means for reversing the sculling mechanism for the purpose of backing the boat.

A further object of this invention is generally to improve this class of propelling mechanism so as to increase its utility, durability, and efficiency.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a section of a canoe showing the installation of the sculling mechanism. Fig. 2 is a slightly enlarged plan view of same. Fig. 3 is an end view of a canoe showing the application of the invention. Fig. 4 is an enlarged detail of the spring connection on the reversing chain. Fig. 5 is an enlarged view of the reversing wheel. Fig. 6 shows the application of a modification. Fig. 7 is a plan view of same.

Referring to the drawings A indicates the propeller shaft which is appropriately journaled in a suitable stern bearing, as shown at 2. On the outer end of the propeller shaft is secured a T-shaped member 3, in which is mounted a vertical shaft 4, having formed on its lower end a crank arm 5 to which is secured a propeller blade 6.

Secured to the upper end of the vertical shaft 4 is a sprocket wheel 7, which is connected by a chain 8 to a similar sprocket wheel 9 secured to a reversing wheel 10, which is provided with a vertical shaft 11 supported in a socket member 12 which is secured to the inner end of the propeller shaft A.

Referring to the enlarged detail of the reversing mechanism shown in Fig. 5, it can be seen that the reversing wheel 10 is pro-

vided with a downwardly projecting lug 13, which is adapted to register with one or the other of a pair of slots 14 formed in the hub portion of the socket member 12. This makes it possible to slightly lift the reversing wheel until the lug becomes disengaged with one of the slots 14. The wheel may then be turned one-half of a revolution until the lug 13 registers with the opposite slot connected with same by forcing the wheel and lug, into register with the slot.

The object of the reversing wheel or changing the position of same is for the purpose of controlling the position of the crank arm 5 and propeller blade. When the propeller is positioned as shown in Fig. 1, it will exert its pressure to drive the boat in the direction of arrow *a*, while if the reversing wheel 10 is turned to cause the lug 13 to register with the opposite slot 14, motion will be transmitted through the sprocket 9, chain 8, and sprocket 7 to partly revolve the vertical shaft 4 and connected crank arm and propeller to the dotted line position shown in the same figure, where the angle of the blade will be exerted to reverse the direction.

The propeller mounted and positioned as here shown, will exert its driving force by being oscillated or rocked from side to side; motion to oscillate the propeller being transmitted from a rocker shaft 13^a suitably journaled in the center of the boat, as shown in Figs. 1 and 2, and a flexible connection 14^a. The shaft 13^a may be rocked by any suitable means, or as here shown by foot pedals 15 connected by links 16 to the rocker arm 17 secured on the shaft.

In operation the operator may be seated upon a suitable seat as indicated at 18, where he will be in position to exert foot pressure on the pedals 15 and 15^a. Supposing the pressure is exerted upon the pedal 15: this would tend to rock the propeller shaft A with the propeller and connected parts in the direction of arrow *b*, as shown in Figs. 2 and 3. The angle assumed by the propeller blade 6 in traveling in the direction of arrow *b* would be that indicated in the plan view of Fig. 2. The angle here shown would tend to force the boat in the direction of arrow *a*. However, when the propeller has come to the end of the stroke and the opposite pedal 15^a is depressed, the propeller shaft and connected parts would be rocked in the opposite direction to arrow *b*, and the propeller blade

and crank would immediately turn in the direction of arrow *c* and assume the position indicated by dotted lines at 19, Fig. 2.

The reversing of the position of the propeller blade to assume the different angles in oscillating or rocking back and forth, is produced by two different means; the first of these being the reversing of direction of oscillation, which would cause the pressure of the water to be exerted against the area of the propeller blade. This would cause the propeller blade and crank arm to swing around about its pivot or the vertical shaft 4 which is mounted in the T-shaped member, until it assumes the position shown at 19, where it is held against further movement by a positive stop or like means.

In the preferred form of construction, shown in Figs. 1 and 2, the means employed for limiting the reversing movement of the propeller blade will be as follows: By referring to the plan view of Fig. 2, it can be seen that the sprocket wheel 7, which is secured to the vertical shaft 4, is turned to allow the crank arm and connected propeller blade to assume the position indicated in full lines in Fig. 2. This revolving movement of the sprocket is accomplished by inserting a flexible section 20 in the chain, and a positive stop to limit the movement of the flexible section as shown by the cord 21. Thus, when pressure is exerted upon the propeller blade by its movement through the water, it can be seen that it will have a tendency to straighten out in the direction of arrow *d*. This pressure will cause the sprocket wheel to turn, and will expand the flexible section or spring 20 until it has been expanded to its limit, which is controlled by the cord 21. This position having been reached, the propeller blade has assumed its most efficient driving angle and will maintain this position until reaching the end of its stroke, at which moment it will be reversed to assume the opposite angle indicated at 19; this being caused by the pressure of the water exerted against it the moment reverse oscillation takes place, and also by the pull of the spring 20. The opposite side of the chain is also provided with a similar flexible section, as indicated at 20^a, which will in turn expand to its limit, which limit will determine the position assumed by the propeller on the return stroke. The reversing wheel and connected sprocket 9 remain stationary and are only operated when it is desired to turn the crank into the dotted line position shown in Fig. 1, where it will exert its pressure in the opposite direction and reverse the movement of the boat. The reversing of the angle of the blade when oscillating from side to side in this position is accomplished in a similar manner, as previously described.

Referring to Figs. 6 and 7 I have shown a

similar propelling mechanism wherein the reversing mechanism is considerably modified; the reversing chain and sprockets being entirely eliminated. This construction is more suitable for installation in small boats, canoes, and the like. Here the upper end of the vertical shaft 4 is provided with a collar 22, which is provided with a pair of stops 23 and 24 provided for the purpose of limiting and controlling the angle assumed by the crank and propeller blade in rocking from side to side; these stops being so positioned as to contact with similar stop 25 and 26 secured to the T-shaped member.

It can readily be seen by referring to Fig. 7 that if the propeller blade is traveling in the direction of arrow *e*, that the moment reverse action takes place the pressure of the water exerted against the surface *f* of the propeller will cause this to swing around its axis on the arc indicated by the arrow *g*, and to assume the opposite angle indicated by the dotted lines 27; it being held in this position by the stop 24 on the collar coming into engagement with the stop 26 on the T-shaped member. This position is maintained until the direction of oscillation is reversed by the rocking movement of the shaft, and pressure is exerted on the opposite face of the propeller, which will cause it to swing back and assume the position shown by the full lines in Fig. 7. It can also be seen that the direction of travel of the boat or the steering of same, may be controlled by the movements of the oscillating propeller, as it is possible to control the rocking movement of the propeller from one side to the other, and cause the propeller to exert more pressure on one side than the other; this being controlled by the pressure applied to the pedals 15 and 15^a. By giving one a longer stroke than the other it will correspondingly transmit the movement through the propeller shafting to the propeller, and cause this to swing in a larger arc on one side than on the other; or in other words, produce a long stroke on one side and a short stroke on the other, or more pressure on one side of the boat than on the other, thus making it possible to control the direction of the boat by increasing or decreasing the length of the stroke of the propeller on either side of the boat.

The oscillating or rocking movement transmitted to the propeller shaft through the pedals 15, links 16 and rocker-arm 17 is always limited by the bottom of the boat. The link member 16 will thus form a positive stop between the pedal 15 and rocker-arm 17 the moment the pedal has been depressed to its lowest position where it engages the bottom of the boat, and will thus form a positive stop which limits the oscillating movement of the propeller shaft.

The variable stroke, as before described, is otherwise limited by the foot pressure exerted upon the pedals.

The apparatus can be cheaply constructed, easily installed, and is efficient and reliable in action, and takes no more space than any other propelling mechanism. The materials and finish of the several parts of the mechanism are such as experience and judgment of the manufacturer may dictate.

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

1. A propelling mechanism comprising in combination a propeller shaft, a T-shaped member secured on the end of the shaft, means for oscillating said shaft and T-shaped member, a vertical shaft mounted in said T-shaped member, a crank arm formed on the lower end of said shaft, a propeller blade secured to said crank arm, means for limiting the oscillation or swinging movements of the propeller shaft, and means for reversing the angle of the propeller blade assumed with relation to the propeller shaft at the end of each oscillation.

2. A propelling mechanism comprising in combination a propeller shaft, a T-shaped member secured on the end of the shaft, means for oscillating said shaft and T-shaped member, a vertical shaft mounted in said T-shaped member, a crank arm formed on the lower end of said shaft, a propeller blade secured to said crank arm, means for limiting the oscillation or swinging movements of the propeller shaft, means for reversing the angle of the propeller blade assumed with relation to the propeller shaft at the end of each oscillation, and means for controlling the angle assumed by the propeller blade with relation to the propeller shaft.

3. A propelling mechanism comprising in combination a propeller shaft, a T-shaped member secured on the end of the shaft, means for oscillating said shaft and T-shaped member, a vertical shaft mounted in said T-shaped member, a crank arm formed on the lower end of said shaft, a propeller blade secured to said crank arm, means for limiting the oscillation or swinging movements of the propeller shaft, means for reversing the angle of the propeller blade assumed with relation to the propeller shaft at the end of each oscillation, means for controlling the angle assumed by the propeller blade with relation to the propeller shaft, and means for reversing the propeller for the purpose of reversing the force exerted by same.

4. A propelling mechanism comprising in combination a propeller shaft, a T-shaped member secured on the end of the shaft, a rocker-arm secured to the shaft, links connecting said arm with a pair of pedal members, means for limiting the movement of said pedals, a vertical shaft mounted in said T-shaped member, a crank-arm formed on the lower end of said shaft, a propeller blade secured to said crank-arm, and means for reversing the angle of the propeller blade assumed with relation to the propeller shaft at the end of each oscillation.

5. A propeller mechanism comprising in combination a propeller shaft, a T-shaped member secured on the end of the shaft, a rocker-arm secured to the shaft, links connecting said arm with a pair of pedal members, a vertical shaft mounted in said T-shaped member, a crank-arm formed on the lower end of said shaft, a propeller blade secured to said crank-arm, a sprocket wheel secured to the upper end of the vertical shaft, a stationary sprocket wheel mounted on the propeller shaft, a pair of chains connecting said sprocket wheels, a pair of helical springs interposed between the ends of said chains, means for limiting the yielding movement of said springs, and means for reversing the position of the stationary sprocket wheel.

6. A propeller mechanism comprising in combination a propeller shaft, a T-shaped member secured on the end of the shaft, a rocker-arm secured to the shaft, links connecting said arm with a pair of pedal members, a vertical shaft mounted in said T-shaped member, a crank-arm formed on the lower end of said shaft, a propeller blade secured to said crank-arm, a sprocket wheel secured to the upper end of the vertical shaft, a T-shaped socket member secured to the propeller shaft, a reversible sprocket wheel mounted in said socket, downwardly projecting lugs formed on said sprocket wheel adapted to register with corresponding grooves formed on the top face of the socket, a pair of chains connecting said sprocket wheels, a pair of helical springs interposed between the ends of said chains, and means for limiting the yielding movement of said springs.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ESKIL JUBERG.

Witnesses:

JOHN H. HERRING,
W. W. HEALEY.