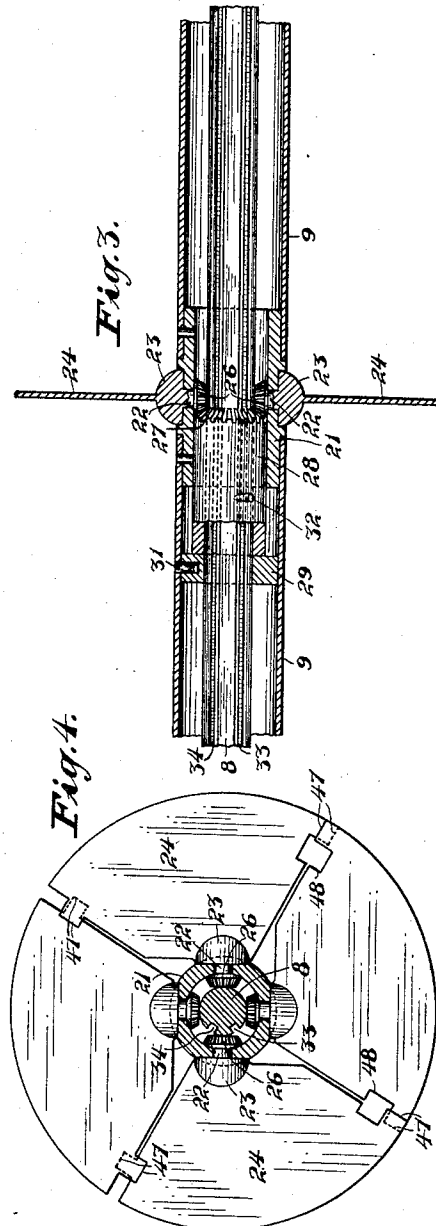
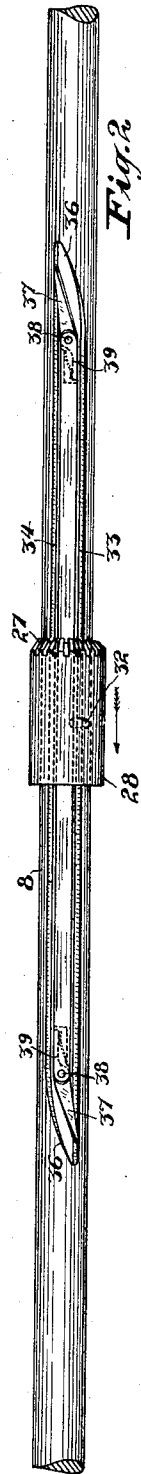
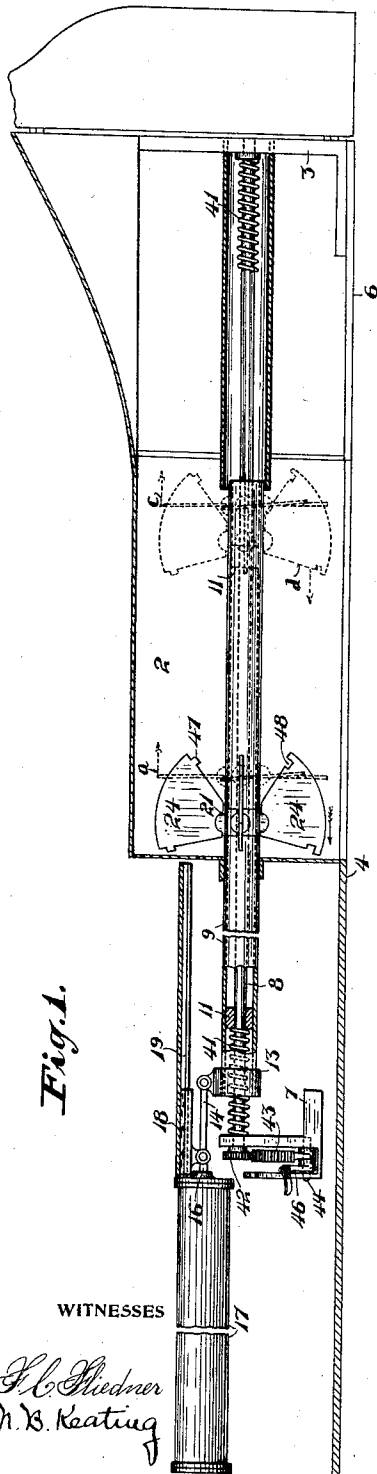


O. PETERSON.
PROPELLER.

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INVENTOR

Olof Peterson

BY

J. M. Wright

ATTORNEY

UNITED STATES PATENT OFFICE.

OLOF PETERSON, OF ALAMEDA, CALIFORNIA.

PROPELLER.

1,063,726.

Specification of Letters Patent.

Patented June 3, 1913.

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To all whom it may concern:

Be it known that I, OLOF PETERSON, a subject of the King of Sweden, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Propellers, of which the following is a specification.

The object of the present invention is to provide a propeller for causing propulsion through a fluid, such as that of a vessel through water, which will be more efficient than the ordinary screw propeller.

In the accompanying drawing, Figure 1 is a side view of my improved propeller in a vessel, part of the vessel being shown in section; Fig. 2 is an enlarged side view of the stationary guide of the propeller; Fig. 3 is a broken longitudinal sectional view of the propeller tube; Fig. 4 is a transverse section through the guide.

Referring to the drawing, 1 indicates the hull of a vessel, the lower portion of which is formed with a recess 2 to enable the water to enter and be acted upon by the propeller.

3 indicates the stern post which is connected with the keel 4 by the beam 6. 7 indicates a suitable support within the vessel. In said stern post 3 and support 7 are bearings in which is mounted a rotatable longitudinal cylindrical guide 8, and on said guide can slide a tube 9, having inner and outer terminal heads 11. Said tube is extended forwardly, past the front head 11, and has connected thereto a collar 13 which is attached to the rear end of a link 14, the front end of which link is attached to the rear end of a piston rod 16, connected to a piston in a cylinder 17. To prevent the tube 9 turning about its axis, the forward end of the link 14 is connected to a slide-piece 18, which slides upon a longitudinal guide rod 19, stationarily secured in any suitable manner. It is evident that, by the reciprocation of the piston in the cylinder 17, the tube 9 can likewise be caused to reciprocate on the guide 8. Said tube 9 is composed of two terminal sections, and an intermediate section 21, in which are journaled shafts 22 directed at right angles to the axis of the guide, and having on their outer ends, hubs 23, by which are supported blades 24. The inner ends of the shafts have secured thereon beveled pinions 26

which mesh with a bevel gear 27 formed on the end of a sleeve 28 within the section 21, and prevented from longitudinal movement away from said section by a collar 29 within the tube 9, and secured thereto by a screw 31, which collar abuts against the rear end of the sleeve 28. The sleeve 28 is thus permitted rotary movement relatively to said section 21, while prevented from reciprocating longitudinally relatively thereto. A pin 32 extends inwardly from said sleeve 28, and engages each, in turn, of two parallel longitudinal grooves 33, 34, in said guide 8, each groove, at one end, being extended obliquely, as shown at 36, to connect with the other groove. One side of each oblique groove 36 is formed by a latch 37, pivoted on the guide 8, as shown at 38, and having spring-pressed heels 39. Each latch is arranged by its spring to close the straight end of the groove, but, when the pin 32, in the reciprocation of the tube 9, arrives at said latch, it presses the latch against the action of said spring, and passes said latch, whereupon the latch is, by the spring, immediately moved back to the forward position, so that, upon the return movement of the pin, the pin engages the other side of the latch, and travels in the reverse direction in the oblique groove 36, and then in the other straight groove. By this arrangement the pin is automatically caused to travel in one direction in one groove and in the other direction in the other groove.

The parts are shown in Fig. 1 in the position at the extreme end of the front stroke of the piston, and when the pin is at the extreme front end of the groove. In this position, indicated at *a* in Fig. 1, the blades all extend substantially parallel with the axis of the guide 8. On moving rearwardly to the position shown at *a* in Fig. 1, the pin travels in the front oblique groove 36, and in so doing the sleeve 28 is rotated through a corresponding arc, whereby all the bevel pinions are rotated through substantially 90 degrees, so that all the blades extend at right angles to the guide. Said blades thus present an extended surface to thrust back the water and advance the vessel. They remain so extended until they arrive at the position marked *c* in Fig. 1, corresponding to the end of the rear stroke of the piston in the cylinder, then they return by the rear

oblique groove 36, and in so returning the reverse operation takes place to that formerly described, and they are moved into a position parallel with the guide 8, as shown at *d* in Fig. 1, and in this position they return to the position marked *a* in Fig. 1.

Around each end of the guide 8 are coiled springs 41, against which abuts the corresponding head 11 in the reciprocation of the sleeve, and thus shock or jar is avoided.

In order to reverse the action of the propeller, the forward end of the guide 8 is provided with a pinion 42 which meshes with a segment gear 43 carried on a horizontal shaft 44, having a crank handle 46. By turning this crank handle, the guide 8 can be turned through three-quarters of a revolution, so that, upon reciprocation of the tube 9, the blades will be closed together in the forward movement and will be parallel with each other in the rearward movement, thus causing the vessel to make backward.

The axial line of each shaft 22 extends through the corresponding blade on one side of its center, so that the pressure of the water on the blade on one side of said axial line is greater than on the other side, and said pressure of the water tends to help to turn the blade to the proper position, parallel with the guide in going forward and at right angles to the guide in going backward. From the radially extending edges of the blades project tangentially lugs 47, which are adapted to engage adjacent lugs of adjacent blades to support the blades upon one another and prevent further turning of the same. Two of these lugs are at the extreme ends of said edges, while two other lugs are at a short distance from said end, and the blades are formed with corresponding located recesses 48 to permit said lugs of the other blades to pass therethrough in turning to make the three-quarter turn necessary for reversing.

I claim:—

1. The combination of a guide having parallel grooves and oblique grooves connecting the parallel grooves at their ends, a sleeve movable longitudinally on said guide, and having a pin engaging said groove, a tube around said sleeve, means for preventing the rotation of said tube, radially extending shafts, in said tube, bevel gears on the inner ends of said shafts, a bevel gear on an end of said sleeve meshing with the aforesaid bevel gears, blades carried by said shafts, and means for reciprocating said tube.

2. The combination of a guide having parallel grooves and oblique grooves connecting the parallel grooves at their ends, a sleeve movable longitudinally on said guide, and having a pin engaging said grooves, a tube around said sleeve, means for preventing the rotation of said tube,

said tube extending beyond the ends of the grooves, heads therefor at said extended ends, radially extending shafts in said tube, bevel gears on the inner ends of said shafts, a bevel gear on an end of said sleeve meshing with the aforesaid bevel gears, blades carried by said shafts, and means for reciprocating said tube.

3. The combination of a guide having parallel grooves, and oblique grooves connecting the parallel grooves at their ends, each groove having at one end thereof means for preventing return movement there-through and for guiding the pin into the other groove, a sleeve movable longitudinally on said guide, and having a pin engaging said grooves, a tube around said sleeve, means for preventing the rotation of said tube, radially extending shafts in said tube, bevel gears on the inner ends of said shafts, a bevel gear on an end of said sleeve meshing with the aforesaid bevel gears, blades carried by said shafts, and means for reciprocating said tube.

4. The combination of a guide having parallel grooves and oblique grooves connecting the parallel grooves at their ends, a sleeve movable longitudinally on said guide, and having a pin engaging said groove, a tube around said sleeve, means for preventing the rotation of said tube, radially extending shafts in said tube, bevel gears on the inner ends of said shafts, a bevel gear on an end of said sleeve meshing with the aforesaid bevel gears, blades carried by said shafts, means at the edges of the blade for supporting said blades upon one another, and means for reciprocating said tube.

5. The combination of a guide having parallel grooves, and oblique grooves connecting the parallel grooves at their ends, a sleeve movable longitudinally on said guide, and having a pin engaging said grooves, a tube around said sleeve, means for preventing the rotation of said tube, radially extending shafts in said tube, bevel gears on the inner ends of said shafts, a bevel gear on an end of said sleeve meshing with the aforesaid bevel gears, blades carried by said shafts, means for turning said guide through a part of a revolution to reverse the action of said blades, and means for reciprocating said tube.

6. The combination of a guide having parallel grooves, and oblique grooves connecting the parallel grooves at their ends, a sleeve movable longitudinally on said guide, and having a pin engaging said grooves, a tube around said sleeve, means for preventing the rotation of said tube, said tube extending beyond the ends of the grooves, heads therefor at said extended ends, resilient stops for said heads, radially extending shafts in said tube, bevel gears

on the inner end of said shafts, a bevel gear
on an end of said sleeve meshing with the
aforesaid bevel gears, blades carried by said
shafts and means for reciprocating said
5 tube.

7. The combination of a guide having
parallel grooves and oblique grooves con-
necting the parallel grooves at their ends,
each groove having at one end thereof
10 spring-actuated latches for preventing re-
turn movement therethrough and for guid-
ing the pin into the other groove, a sleeve
movable longitudinally on said guide, and
having a pin engaging said grooves, a tube
15 around said sleeve, means for preventing
the rotation of said tube, radially extending
shafts in said tube, bevel gears on the inner
ends of said shafts, a bevel gear on an end
of said sleeve meshing with the aforesaid

bevel gears, blades carried by said shafts, 20
and means for reciprocating said tube.

8. The combination of a longitudinal
guide, a reciprocable device adapted to be
guided in its reciprocable movement by said
guide, said guide having two guideways for 25
so guiding said device, blades rotatably car-
ried by said device, means moving with the
device for rotating said blades, and means
at each end of the guideway, for producing
a relative rotation of the device relatively 30
to said guide.

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

OLOF PETERSON.

Witnesses:

FRANCIS M. WRIGHT,
D. B. RICHARDS.

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