

UNITED STATES PATENT OFFICE.

CLAUDE SINTZ, OF GRAND RAPIDS, MICHIGAN.

REVERSIBLE PROPELLER-WHEEL.

No. 878,095.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLAUDE SINTZ, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Reversible Propeller-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvement in reversible propeller wheels, and its object is to provide a strong, compact structure; to provide improved means for holding, shifting and driving the blades; to provide a hub that will present but little obstruction in passing through the water, and that will not readily become fouled; to provide a wheel that will be easily shifted when in operation; to provide a device that is easily manufactured, and that may be readily assembled and dis-assembled; and to provide the same with various new and useful features, hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings, in which:

Figure 1. is a transverse section on the line 1—1 of Figs. 2 and 4; Fig. 2. a longitudinal section of the same; Fig. 3. a rear end elevation of the case or shell; Fig. 4. a plan view of the hub complete; and, Fig. 5. a transverse section of the same on the line 5—5 of Figs. 2 and 4.

Like numbers refer to like parts in all of the figures.

1 represents the driving shaft rotated by any convenient motor; 2 is a sleeve slidable on the shaft and manually adjusted in the usual way by any convenient means; 3 is the case or shell of the hub provided with internal key-ways 4 and also having elongated radial openings 5 corresponding to the number of blades of the wheel, three being herein shown.

Each opening is surrounded with a plane surface 6 on which the outer flange 13 of the blade 12 is slidable and is closed at the rear by a conical cap 7 which also closes the rear end of the shell. This cap is secured in place by screws 8 having their heads recessed into the cap. 9 is a triangular head fixed on the end of the shaft 1 by a key 17. On the head

9 are radial studs 10 projecting within the openings 5, on which studs the blades are journaled by means of integral tubular shanks each having an inner flange 14 engaging the inner surface of the shell to hold the blade in place on the stud. Said shanks are also provided with radial arms 16 to rotate and adjust the blades upon the stud 10. Each arm is slotted at the outer end, and inserted in the slot is a pin 15 secured in the shell 3 whereby as the shell is moved longitudinally of the shaft the blades are rotated on the studs and adjusted to drive either forward or backward or in intermediate position.

To adjust the shell longitudinally of the shaft and head, the same is connected and secured to the sleeve 2 by means of a bushing 18 interposed between the shell and sleeve and secured to each by screw threads.

In the head 9 and opposite the end of the shaft 1, are splines or keys 11 adapted to traverse the key-ways 4 as the shell is adjusted longitudinally of the shaft. These splines thus adjustably connect head and shell, and thus serve to rotate the shell positively and simultaneously with the shaft. Each blade is thus driven internally by the corresponding stud 10 and externally by engagement of the shank with the side of the slot 5 in the head.

It will be noted that the hub entire consists of a symmetrical pear shaped structure having a flattened portion opposite each blade and that the flanges 13 engaging said portions are each a section of a globe having a radius corresponding to the radius of the shell whereby a smooth and symmetrical body is provided adapted to pass freely through the water longitudinally, and to rotate rapidly therein, with but little resistance, and that there are practically no projections to which grass or weeds can become attached.

It will also be observed that by removal of the cap 7, the shell and openings 5 are all open rearwardly and that the shell can be slid forward on the shaft and the parts within the same readily dis-assembled, or assembled. Also by the use of the sleeve 18, the forward end of the shell 3 may be bored and the key-ways cut therein with facility and convenience. Furthermore the engagement of the shell with the shank of the blade being

opposite the end of the stud, there will be no cramping or binding of the same to prevent or hinder shifting the device manually when in operation.

5 Obviously the connection between the shaft and shell may be omitted and the blades driven quite effectively by the studs only. It will also be noted that no screws or keys are used to hold the blades in place
10 and that they can always be easily removed or replaced by merely removing the screws 8 that hold the cap and sliding the shell forward on the shaft.

What I claim is:

15 1. A propeller wheel, comprising a head adapted to be secured to a shaft, radial studs on the head, a shell surrounding the head, radial slots in the shell opposite the studs, blades having tubular shanks rotative on the
20 studs and adapted to traverse the slots, flanges on the shanks engaging and traversing the inner surface of the shell, and means for connecting the shell and shanks to rotate and adjust the blades on the studs.

25 2. A propeller wheel, comprising a head adapted to be attached to a shaft, radial studs on the head, a shell having radial slots opposite said studs, said shell and slots being open at the rear, a conical cap detachably
30 secured to the rear of the shell to close the shell and slots, blades having tubular shanks rotative on the studs, flanges on the shanks engaging and traversing the interior of the shell and means for connecting the shell and
35 shanks to adjust and hold the blades.

3. A propeller wheel, comprising a head adapted to be fixed on the end of a shaft, radial studs on the head, a shell surrounding the head and longitudinally adjustable, said
40 shell having slots opposite the respective studs, blades having tubular shanks journaled on the studs and traversing the slots, flanges on the shanks engaging and traversing the inner surface of the shell, slotted arms on the
45 shanks and pins fixed in the shell and engaging the slots of the arms.

4. A propeller wheel, comprising a head adapted to be fixed on a shaft, radial studs on the head, a tubular shell surrounding the
50 head and having radial slots opposite the studs, means for slidably connecting the head and shell, blades having tubular shanks journaled on the studs and traversing the slots, flanges on the shanks and engaging the
55 inner surface of the shell, and a detachable cap to close or open the rear end of the shell and slots therein.

5. A propeller wheel, comprising a substantially pear-shaped shell having radial
60 slots, said shell and slots being open at the rear end, a detachable conical cap to close the shell and slots, a head within the shell and slidably connected thereto, radial studs on the head and projecting within the said

slots, blades having tubular shanks jour- 65
naled on the studs and traversing the slots, flanges on the shanks engaging and traversing the inner surface of the shell and means for connecting the shell, and shanks to ad-
just and hold the blades. 70

6. A propeller wheel, comprising a substantially pear-shaped shell having radial slots and plane surfaces surrounding the slots, a head within said shell, means for slidably connecting the head and shell, 75
blades having shanks inserted in said slots and traversing the same, means for rotatively connecting the shanks and the head, inner and outer flanges on the shanks and engaging the respective inner and outer sur- 80
faces of the shell, and means for connecting the shell and shanks to rotatively adjust the blades.

7. A propeller wheel, comprising a shell open at the rear and having radial slots also 85
open at the rear, a detachable conical cap to close said shell and slots, a head within said shell, an internal key-way in the shell, a spline in the head and traversing the key-way, radial studs on the head and extending 90
within the slots, blades having tubular shanks journaled on the studs, flanges on the shanks engaging the inner surface of the shell, slotted arms on the shanks, and pins fixed in the shell and engaging the said slots 95
in the arms.

8. The combination of a shaft, a sleeve slidable on the shaft, a bushing fixed on the sleeve, a shell attached to the bushing and having internal key-ways and radial slots, a 100
head fixed on the end of the shaft, splines in the head and traversing the key-ways, radial studs on the head, blades having tubular shanks journaled on the studs, flanges on the shanks and engaging the inner surface of 105
the shell, a detachable conical cap to close the rear of the shell and slots and means for connecting the shanks and shell to adjust and hold the blades.

9. A propeller wheel comprising a head 110
adapted to be attached to a shaft and driven thereby, blades mounted on the head and rotative on radial axes, means for rotating and adjusting the blades, a shell surrounding the head and longitudinally adjustable 115
thereon, means for slidably connecting the shaft and shell to positively rotate the shell independent of the blades, and means for slidably connecting the shell and the blades, whereby the blades are driven by the shell 120
as well as by the head.

10. A propeller wheel, comprising a head adapted to be fixed on a shaft and rotated thereby, a shell surrounding the head and longitudinally adjustable thereon and also 125
having longitudinal slots, splined connections between the shaft and shell to positively rotate the shell from the shaft, blades

rotative on radial axes and mounted on the
head, said blades having shanks extending
through the slots in the shell and engaging
the sides of said slots whereby the blades are
5 driven by the shell, means for adjusting the
shell longitudinally and means for rotating
and adjusting the blades.

In testimony whereof I affix my signature
in presence of two witnesses.

CLAUDE SINTZ.

Witnesses:

PALMER A. JONES,
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