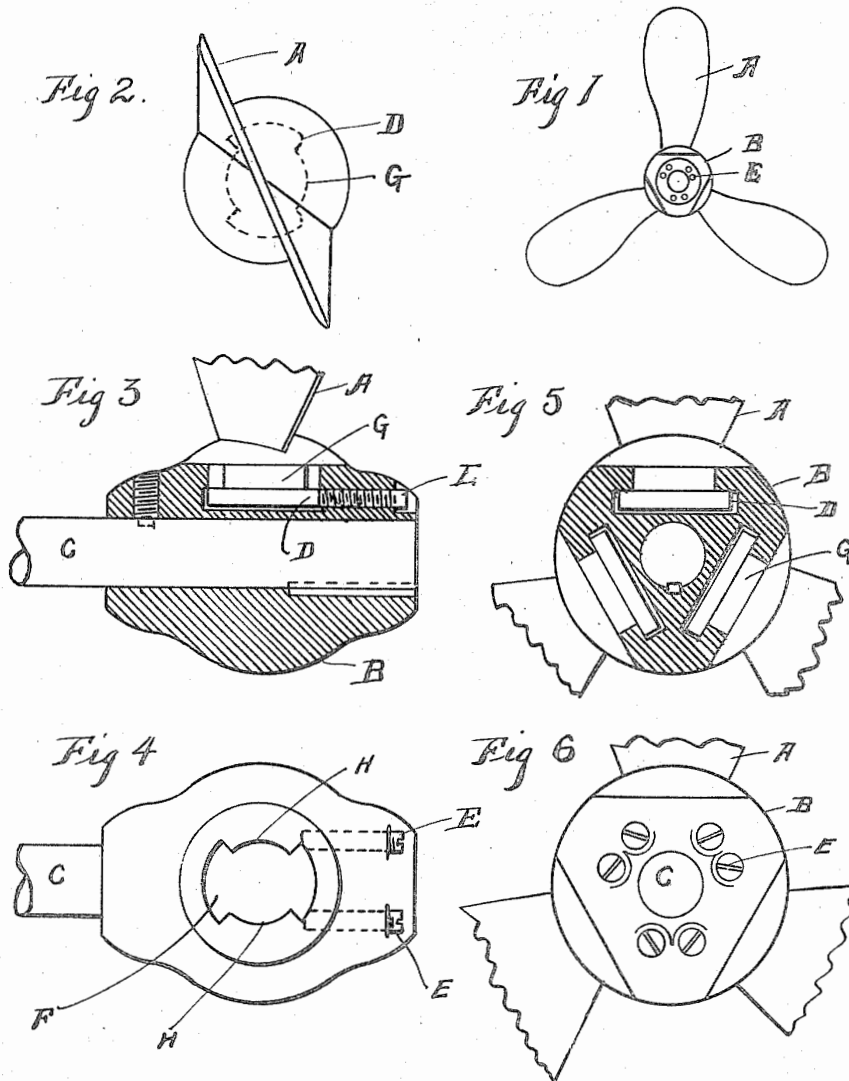


No. 821,534.

PATENTED MAY 22, 1906.

H. J. PERKINS.
PROPELLER WHEEL.
APPLICATION FILED JUNE 2, 1905.



WITNESSES:

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PROPELLER-WHEEL.

No. 821,534.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed June 2, 1905. Serial No. 263,483.

To all whom it may concern:

Be it known that I, HARRY J. PERKINS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Propeller-Wheels, of which the following is a specification.

My invention relates to improvements in propeller-wheels, and particularly to that class of propeller-wheels made in sections, so that a broken section can easily be replaced, and having the blades adjustable to any desired pitch. Its object is to provide for such sectional and adjustable construction and in an especially efficient and simple manner. This object is accomplished by the construction shown in the accompanying drawings, in which—

Figure 1 is an end plan view of the wheel, showing the end of the hub and the three blades. Fig. 2 is an end plan view of one of the blades detached and looking from the outer end toward the center. Fig. 3 is a longitudinal cross-section of the hub, showing in projection the adjusting-screw and a portion of the blade. Fig. 4 is a top plan of the hub, showing the opening into which the shaft of the blade is inserted. Fig. 5 is a cross-section of the hub on a plane at right angles to its axis, showing also in plan portions of the blades. Fig. 6 is an end view of the hub, on a larger scale than Fig. 1, showing the adjusting-screws and portions of the blades.

I have shown a three-bladed wheel; but the invention may as well be applied to a wheel having a different number of blades.

In the drawings, C is the propeller-shaft, and B is the hub of the propeller-wheel. This hub is detachably connected to the shaft by any common means, such as the pin and key shown in Fig. 3. The central portion of the hub is swelled, as shown in Figs. 3 and 4, and at each point where the blades spring from the hub that portion of the hub is developed into substantially the shape of the segment of a sphere. The outer portion of this segment of a sphere is formed as an integral part of the blade, and the joint between the blade and the hub is therefore of the same form, and the two parts are related to each other in the same way as if a segment of a sphere were cut from the main body of the sphere. This form permits the blade to rotate on its

central axis, thus changing the pitch of the blade, but maintaining at all times a smooth and perfect joint at all points with the hub

Each of the propeller-blades is represented by the letter A. From the inner end of each blade there projects a short centrally-located portion which may be spoken of as a "shaft," since it performs some of the functions of a shaft in permitting the rotation of the blade in the hub. It is shown by G in Figs. 2, 3, and 5. Upon its end, which when the blade is in position is the inner end, it carries the broken flange D.

In the flat surface of the hub caused by cutting off the blade in the manner above described there is an opening, (shown by F in Fig. 4,) the main body of which opening is of a size sufficient to receive the shaft G and which is at one or more places expanded so as to permit the flange D to pass therethrough. This opening extends into the interior of the hub, which may be solid excepting for a suitable space shortly below the surface or may be entirely hollow. By reason of this interior space the parts marked H H in Fig. 4 become a broken flange partially surrounding the opening F.

E E, as shown in Fig. 4, constitute a pair of adjusting or locking screws or pins. They are adapted to bear against the corners of the flanges D upon the blade-shafts when the blades are in position. There are as many pairs of these adjusting-screws as there are blades.

The complete propeller-wheel shown is constructed in four main parts—the hub and the three blades. When it is desired to get the wheel ready for use, I take the blade and turn it so that the broken flange D will register with the openings in the broken flange H, and so will pass therethrough. I then give the blade a quarter-turn or as much as may be necessary, and these two broken flanges D and H engage with each other, the flange D being under the flange H, so that withdrawal of the wheel is impossible. I then continue to turn the blade until the position of exactly the desired pitch is obtained. I then turn up the adjusting-screws so that they bear against the two opposite shoulders or portions of the flange D just as they would do if the blade shown in Fig. 2 were inserted in the hub shown in Fig. 4 and then turned

until it occupied the same position which it has in Fig. 2.

If it is desired at any time to readjust the pitch of the blades, it is evident that the blade may be turned in either direction by loosening the proper screw and that then if the other screw is turned in again to bear against the flange D the blade will again be locked in its new position and cannot possibly rotate in either direction. It is apparent also that in case of accident to one blade or wheel it is very easy to remove such blade and substitute a new one, which by the use of common means can be adjusted to exactly the pitch of the remaining blades.

This sectional and adjustable construction produces a wheel as rigid and reliable as a solid wheel, yet with the advantages of sectional construction and adjustability of blades.

It is evident that the means of engagement between the hub and blades and the means of locking the blade in its selected position may be greatly varied without departing from my invention.

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

1. In a propeller-wheel, the combination of a wheel-hub, detachable blades and hubs carried thereby, projections in opposite directions from the blade-hubs and located within the wheel-hub, the latter having an

opening to receive said projections to permit rotation of the blades, means carried by the wheel-hub for detachable engagement with said blade-hub, and independent adjusting devices bearing in opposite directions against the opposing projections from the blade-hub.

2. In a propeller-wheel, the combination of a hub, propeller-blades, means for detachably connecting the hub and blades, means for permitting the blades to rotate in the hub whereby the pitch of said blades may be adjusted, and independent adjusting devices to act against separate parts of each blade to hold the latter in the desired pitch relation.

3. In a propeller-wheel, the combination of the wheel-hub, detachable blades and hubs carried thereby, projections in opposite directions from the blade-hubs and located within the wheel-hub, an opening within the wheel-hub to receive such projections and permitting rotation of the blade, means carried by the wheel-hub for detachable engagement with such blade-hub, and two adjusting and locking screws located within the wheel-hub and bearing in opposite directions against the opposing projections from the blade-hub.

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

HARRY J. PERKINS.

Witnesses:

MARY S. TOOKER,
A. C. DENISON.