No. 885,038. PATENTED APR. 21, 1908.

A. GNAEGY.

PROPELLER.

APPLICATION FILED NOV. 20, 1906.

Fig. 1.

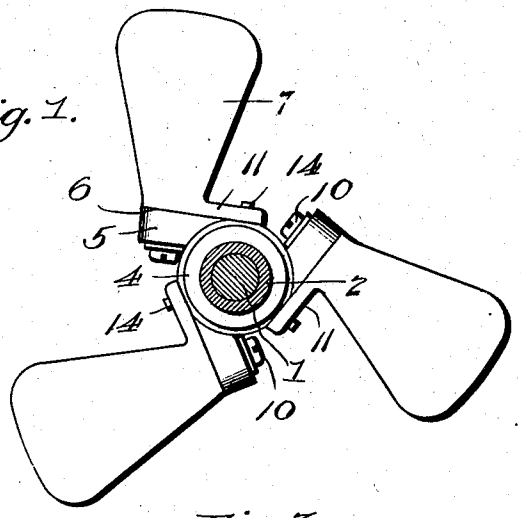


Fig. 2.

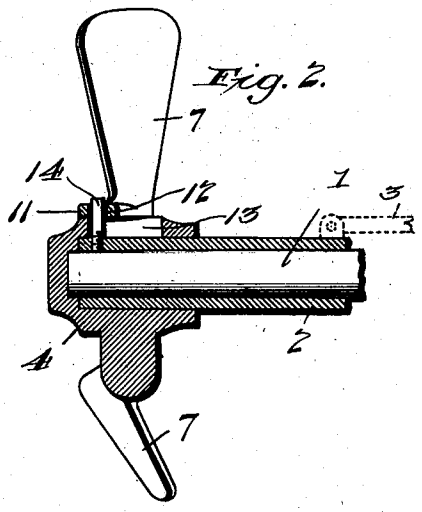


Fig. 3.

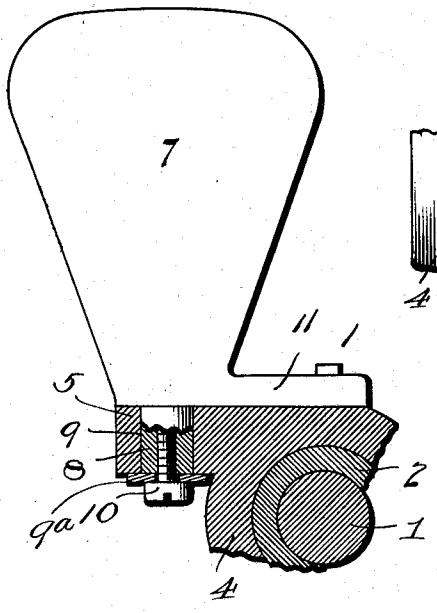
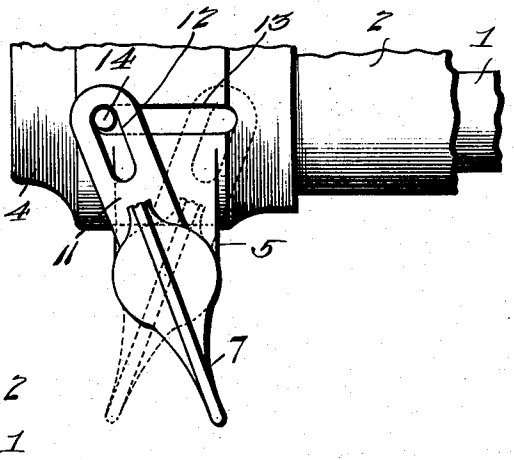


Fig. 4.



Witnesses

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ALBERT GNAEGY, OF CHESTER, ILLINOIS.

PROPELLER.

No. 885,038. Specification of Letters Patent. Patented April 21, 1908.

Application filed November 20, 1906. Serial No. 344,311.

To all whom it may concern:

Be it known that I, ALBERT GNAEGY, a citizen of the United States, residing at Chester, in the county of Randolph and State of Illinois, have invented new and useful Improvements in Propellers, of which the following is a specification.

This invention relates generally to propellers, and particularly to that type having shiftable or reversible blades to facilitate the movement of a vessel in opposite directions.

The object of the invention is to provide a propeller of this character in which the blades shall be so assembled with their supporting hub as that their reversal may in a ready and practical manner be effected with a minimum output of power and the minimum danger of injury in use.

With the above and other objects in view, which will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a propeller as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, Figure 1 is a view in vertical transverse section through a propeller shaft, exhibiting the propeller blades in elevation. Fig. 2 is a vertical longitudinal section through a portion of the propeller. Fig. 3 is a vertical transverse section on an enlarged scale of a portion of the propeller showing more particularly the manner of assembling the blades with the hub. Fig. 4 is a top plan view of a portion of the propeller, showing more particularly the two positions assumed by one of the blades thereof when shifted for the purpose of reversing the direction of motion of the vessel.

Referring to the drawings, 1 designates a shaft which may be of the usual or any preferred construction and driven from any source of power not necessary to be shown. On the forward portion of the shaft is loosely mounted a sleeve that is adapted to slide freely thereon and has combined with it a lever 3 indicated by dotted lines in Fig. 2 to effect longitudinal movement relatively to the shaft 1.

Rigidly combined in any preferred manner with the shaft 1 is a hub 4 which is provided with a plurality of bosses or arms 5 that extend at a tangent to the axis of the shaft. Of these arms any preferred number may be provided, three in this instance being shown. The outer faces of the arms are flat to form bearing faces 6 against which bear the inner ends of the propeller blades 7 which may be of any desired contour. Each of these blades is provided with a stud or pin 8 that is adapted to project through an orifice or opening 9 in the arm 5 and is held in position therein by a washer 9^a and a screw 10, the latter, as clearly shown in Fig. 3 being seated in a threaded opening in the stud. Each propeller blade is further provided with an extension 11 that bears upon the arm 5 and is provided with a longitudinal slot 12, through which projects a pin 14 carried by the outer portion of the sleeve, as clearly shown in Fig. 2, the pin being designed to reciprocate in a slot 13 formed in the hub. The length of the slots 13 is such that when the sleeve is shifted longitudinally of the hub to bring the pins 14 into engagement with one or the other of the end walls of the slots 13, the desired angular adjustment of the blades will be effected to cause the propeller to drive the vessel either forward or rearward as may be desired.

An advantage arising from the tangential disposition of the studs 8 relatively to the major axis of the shaft 1 is that the proper eccentric throw of the blades may be accurately determined and maintained whereby high efficiency of the propeller will be secured. Further by providing the blades with the studs 8 as a sole means of assemblage with the arms 5 but small labor and expense will attend the removal of a broken blade and its replacement by a new one.

What I claim is:

The combination with a shaft, of a hub rigidly connected to one end thereof and extending over the shaft, and of such diameter as to form a recess between the hub and the shaft and provided with a plurality of longitudinally-extending slots, a shiftable sleeve extending in said recess, a plurality of arms formed integral with the hub and extending tangentially with respect to the axis of the shaft, each of said arms provided with a flat face and with an opening, a propeller blade mounted upon each of said arms and formed with an extension having a flat face to bear upon the like face of the arm with a slot extending in the direction of the length thereof, the slots in said extensions being arranged at an angle with respect to the slots in the hub, a stud projecting from each of the blades and

extending in the opening of the arm and formed with a screw-threaded opening, a washer mounted against the lower face of each of the arms, a screw extending through said washer and engaging in said screw-threaded opening for loosely connecting the blade to the arm, and a plurality of pins carried by the outer end of the sleeve and adapted to extend through the slots in the hub and engage in the slots of the extensions for adjusting the blades to various angles when the sleeve is shifted.

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

ALBERT GNAEGY.

Witnesses:

GEORGE W. STALEY,

KINNEY S. MCBRIDE.