H. STAPLES.

SCREW PROPELLER.

APPLICATION FILED NOV. 29, 1913.

1,133,191. Patented Mar. 23, 1915.

Fig. 1.

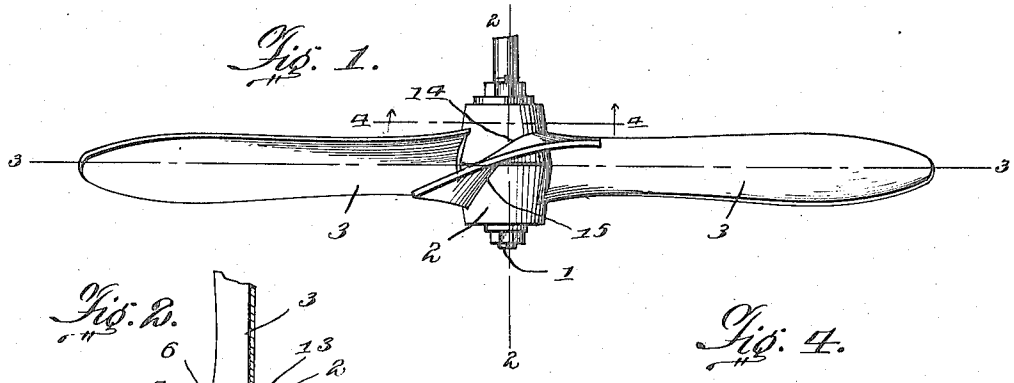

Fig. 2.

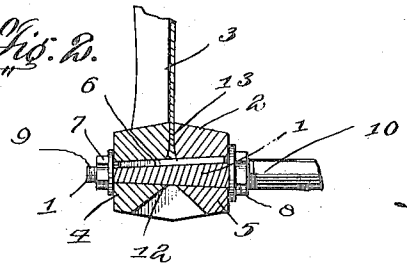

Fig. 3.

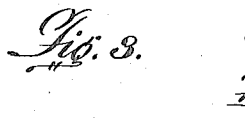

Fig. 4.

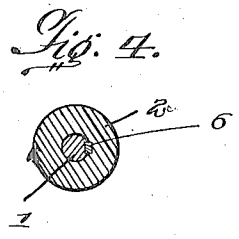

Fig. 5.

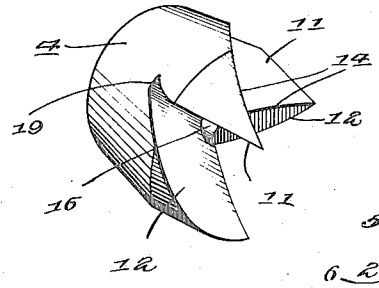

Fig. 6.

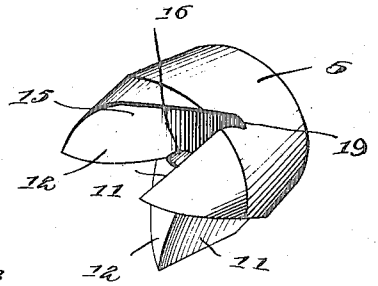

Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

HERSEY STAPLES, OF DIAMOND BLUFF, WISCONSIN.

SCREW-PROPELLER.

1,133,191. Specification of Letters Patent. Patented Mar. 23, 1915.

Application filed November 29, 1913. Serial No. 803,778.

To all whom it may concern:

Be it known that I, HERSEY STAPLES, a citizen of the United States, residing at Diamond Bluff, in the county of Pierce and State of Wisconsin, have invented new and useful Improvements in Screw-Propellers, of which the following is a specification.

This invention relates to improvements in the construction of screw propellers, the present invention being an improvement upon the construction of screw propeller disclosed in my prior application filed July 8, 1913, Serial No. 777,887.

The object of the present invention is to provide a novel construction of sectional hub and propeller flukes or blades, whereby blades of different pitch or speed ratios may be employed, and a new fluke or blade readily substituted in place of a broken one, and particularly to a novel construction of parts whereby the blades are firmly and securely clamped between the hub sections against liability of displacement.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawing in which:—

Figure 1 is a plan view of a propeller embodying my invention. Fig. 2 is a vertical longitudinal section on the line 2—2 of Fig. 1. Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 1. Fig. 4 is a transverse section on the line 4—4 of Fig. 1. Figs. 5 and 6 are perspective views of disassociated hub sections. Fig. 7 is a perspective view of one of the flukes or blades.

Referring to the drawing, 1 designates the propeller shaft, 2 the hub, and 3 the removable flukes or blades. In the present instance I have shown the use of a hub divided to provide a pair of coöperating blade clamping sections, and three equidistantly arranged flukes or blades, but it will of course be understood that a greater or lesser number of blades may be employed and the hub sections correspondingly modified.

The hub 2 consists of a pair of transversely divided sections 4 and 5, secured from rotary motion on a tapered portion of the shaft by a key 6 and from relative separation or endwise motion on the tapered portion of the shaft by clamping nuts 7 and 8 engaging threaded surfaces 9 and 10 of the shaft, the construction being such that the hub sections are firmly, yet detachably, fixed to the shaft. As shown, the hub sections 4 and 5 are divided on an irregular transverse line, the meeting faces thereof presenting opposed longitudinal abutment surfaces 11 and transverse clamping surfaces 12, intersecting said abutment surfaces, between the opposed clamping surfaces of which hub sections the tangs 13 of the blades are clamped. In accordance with my invention, the tangs 13 of the blades are made somewhat spoon-shaped, or of concavo-convex form, and the respective pairs of coacting clamping surfaces 12 of the hub sections are properly shaped to receive and engage said tangs, one of said surfaces having a concaved contour, as shown at 14, the other a similar convex contour, as shown at 15, the construction being such that the tangs of the blades will be interlocked with the clamping surfaces, and thereby held securely against possibility of movement in any direction, it will be observed that this mode of connection insures the firm retention as well as the bracing of the tangs, to adapt them to firmly withstand the pressures to which the blades are subjected.

As shown, the hub sections are provided with openings 16 for passage of the key 6, and the tangs 13 of one of the blades 3 is provided with a notch or recess 17 to interlock with the key at the point where it crosses the same. To further insure the retention of the blades against any possibility of outward movement, the tangs 13 are provided with enlarged thickened ends 18 to interlock with recesses 19 formed at the inner ends of the points of intersection of the faces 11 and 12.

It will be obvious that the construction of hub described enables removable blades having different working or speed ratios to be interchangeably used and a broken blade to be readily removed and replaced, without disturbing any of the other blades, and the advantages of which will be apparent. The invention may also be employed in the construction of all kinds of blades propellers, fans or blowers.

I claim:—

A propeller comprising a shaft, a hub composed of sections divided to present longitudinal abutment surfaces substantially parallel with the axis of the propeller and pairs of coöperating transverse clamping surfaces spirally disposed with relation to the axis of the propeller, said hub sections

having lateral recesses communicating with the spaces between the inner ends of said surfaces and extending inwardly beyond the plane of the abutment surfaces, blades having angularly disposed tangs disposed between said abutment and clamping surfaces and portions to engage and interlock with said lateral recesses, and means for fixing said hub sections to the shaft and holding the same assembled.

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

HERSEY STAPLES.

Witnesses:

MARY L. NELSON,

RALPH MCKEEN.