

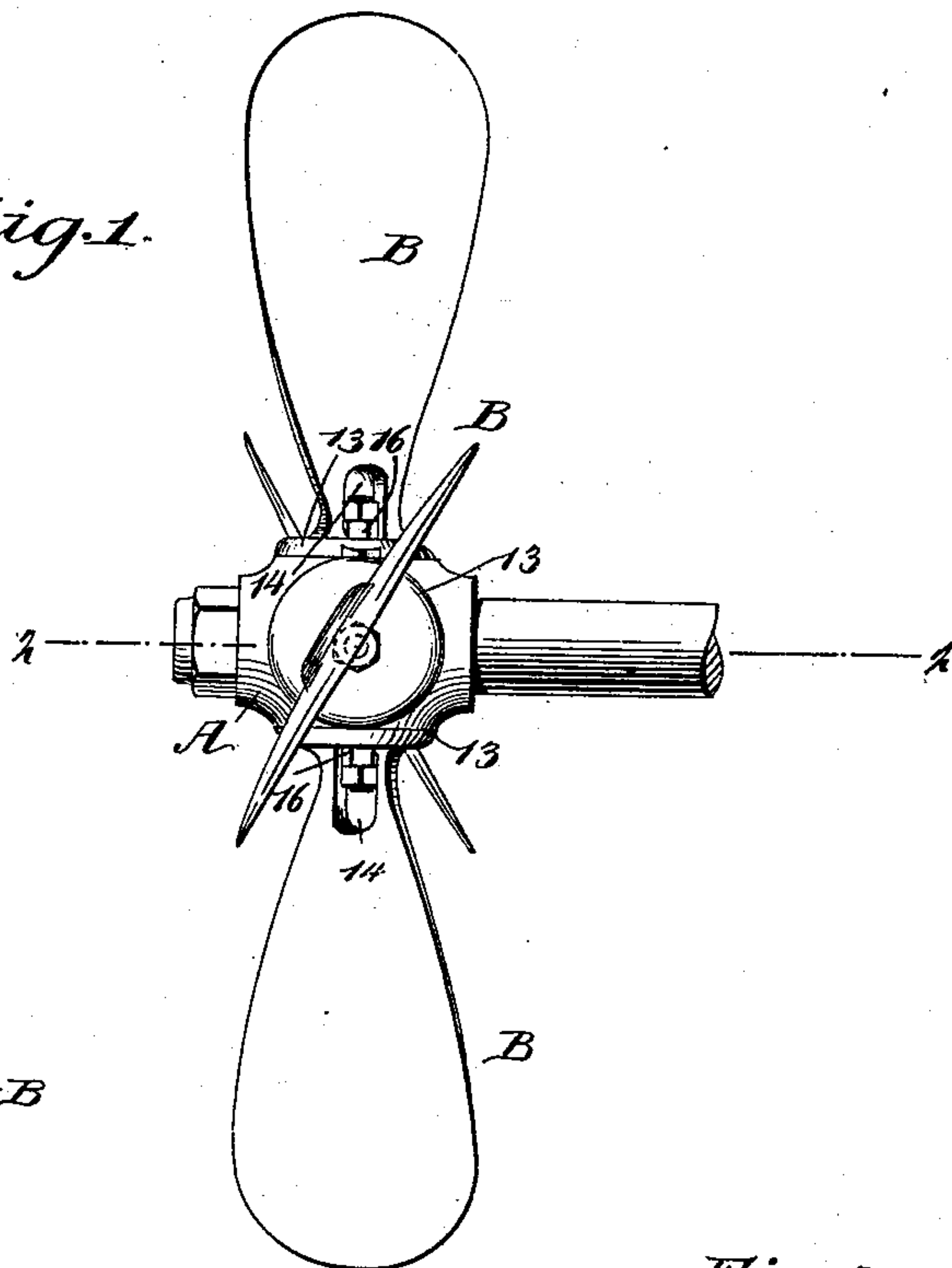
(No Model.)

M. DAVIES.  
PROPELLER.

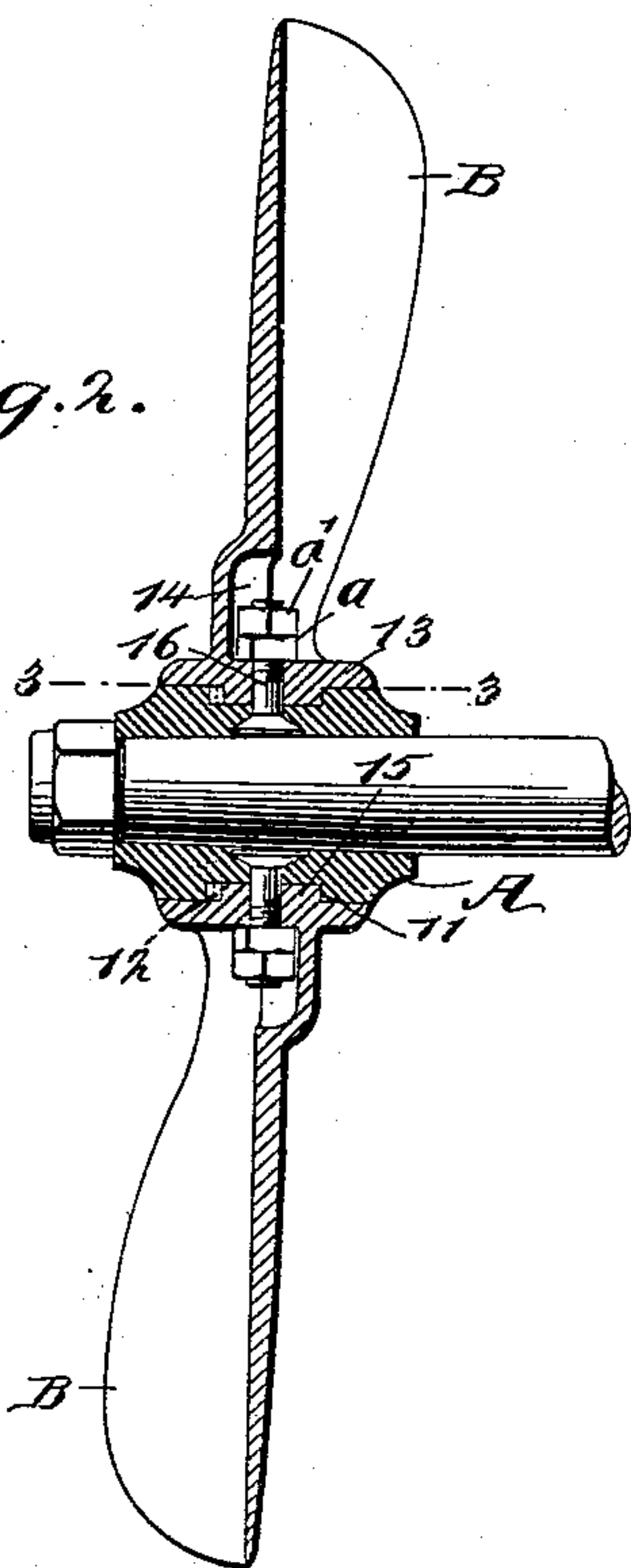
No. 509,204.

Patented Nov. 21, 1893.

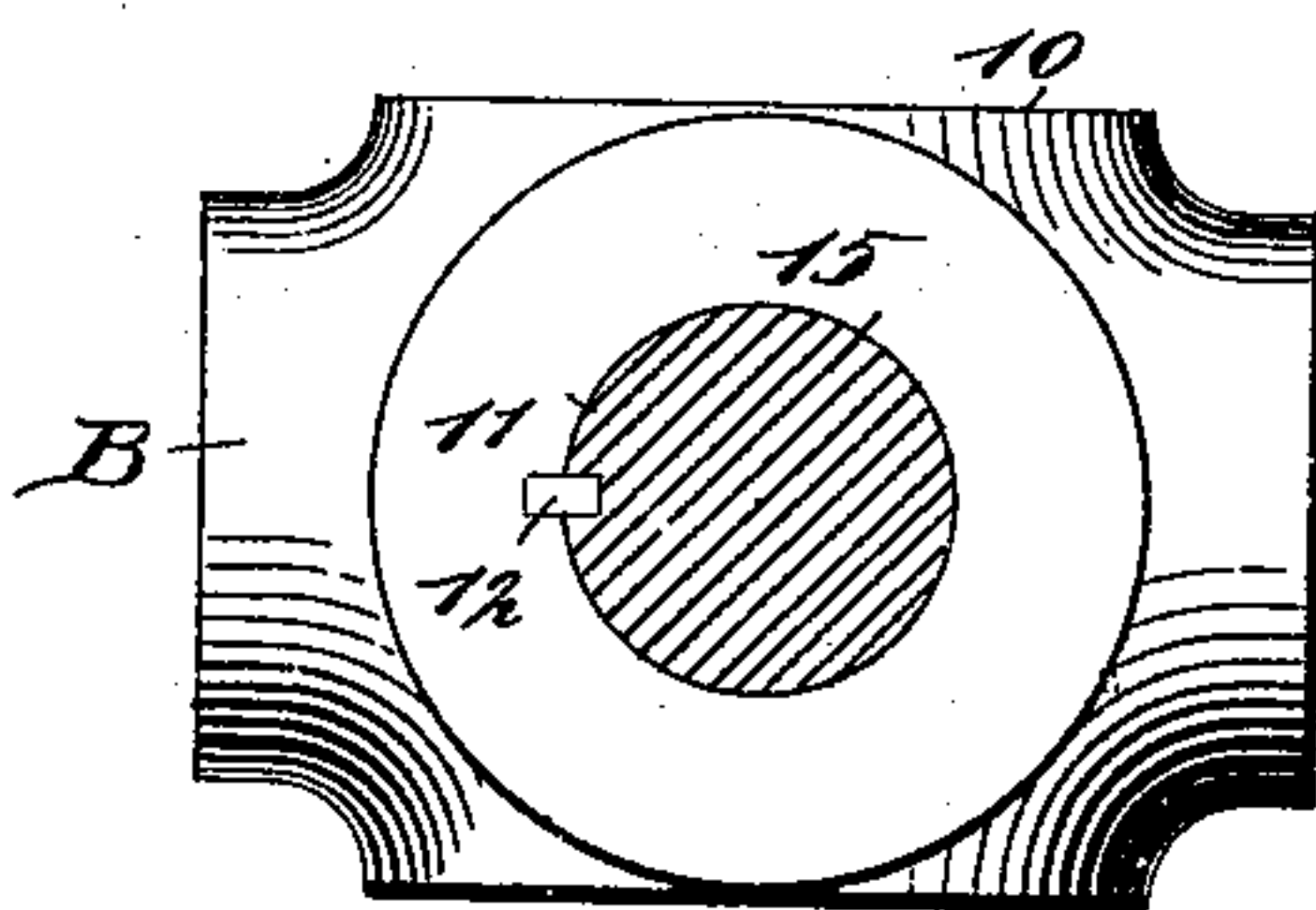
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

MARTIN DAVIES, OF JERSEY CITY, NEW JERSEY.

## PROPELLER.

SPECIFICATION forming part of Letters Patent No. 509,204, dated November 21, 1893.

Application filed April 25, 1893. Serial No. 471,809. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN DAVIES, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Propellers, of which the following is a full, clear, and exact description.

My invention is an improvement in the class of "screw" propellers whose blades, or flukes, are secured to a hub by screws, or screw bolts.

It has been the usual practice to insert screws through the base of the blades, or flukes, from the outer side thereof, so that the inner ends of the screws enter threaded sockets formed in the hub. This mode of fastening has been found to be insecure, and I have devised the improved substitute, hereinafter described, the leading feature of which consists in inserting screw bolts through the hub from the inner side, and then through the bases of the propeller blades, nuts being then applied to their projecting outer ends. The heads of the bolts are countersunk in the interior of the radially-bored hub, and are also preferably arranged to form part of the smooth hub bearing for the propeller shaft.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improved propeller. Fig. 2 is a section taken through the hub and opposing blades, the section being taken on the line 2—2 of Fig. 1; and Fig. 3 is a horizontal section taken essentially on the line 3—3 of Fig. 2.

In carrying out the invention the hub A, may be made of any desired material, or may be given any approved shape.

In the drawings the hub is illustrated as being provided with four faces 10, each of which is adapted to have attached to it a propeller blade or fluke B. Each blade receiving face of the hub is preferably provided with a recess 11, ordinarily of circular shape, and in one wall of the said recess a feather 12, is formed. The flukes or blades B, are

provided with the usual base 13, and above the base the blade or fluke has preferably produced in it a pocket 14, which pocket may be of any desired length and extends longitudinally of the blade to the base, as shown in Figs. 1 and 2. The base of each blade or fluke B, is provided with a boss 15, adapted to enter the recess 11 in the face of the hub receiving the blade. Therefore, the hub recesses 11 and the bosses 15 of the flukes or blades are of the same cross sectional shape, and each boss 15, is provided with a recess adapted to receive the feather 12 of the hub recess in which the boss is introduced.

It will be understood that the feather may be formed upon the boss of a fluke and the receiving recess be produced in the wall of the boss receiving recess of the hub, if in practice it is found desirable.

Each propeller blade or fluke is secured to the hub by means of a screw bolt 16, by inserting its shank through a radial bore or perforation in the hub, from the inner side of the latter, and then through the base 13, of the blade, a nut *a* being then applied to the threaded end of the bolt which projects through said base as shown. A jam nut *a'* may be employed if desired. The head of the bolt fits in a countersink formed in the interior of the hub, as shown in Fig. 2. The connection between the bolt and hub is thus made the most secure possible. The nut *a* being turned down with great force, the blade is clamped and fastened in place with a corresponding degree of security, and yet, if occasion requires, it may obviously be detached with convenience and despatch.

Practical test of the invention in actual use has demonstrated superiority in respect to these qualities.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the hub, having radial bores which are countersunk on the inner side, and propeller blades having a perforated base, of screw bolts whose heads are fitted in the countersinks, their shanks projecting outward through the hub and bases of the blades, as shown and described.



2. The combination, with the hub, having radial bores which are countersunk on the inner side, and recesses on the outer side which are provided with feathers, and the  
5 blades having bosses, 15, and recesses to receive said feathers, of the screw bolts whose heads are fitted in the countersinks and their shanks extending outward through the hub bores and bases of the blades, and nuts applied to said shanks, as shown and described. 10

MARTIN DAVIES.

Witnesses:

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CHAS. COUSE.