

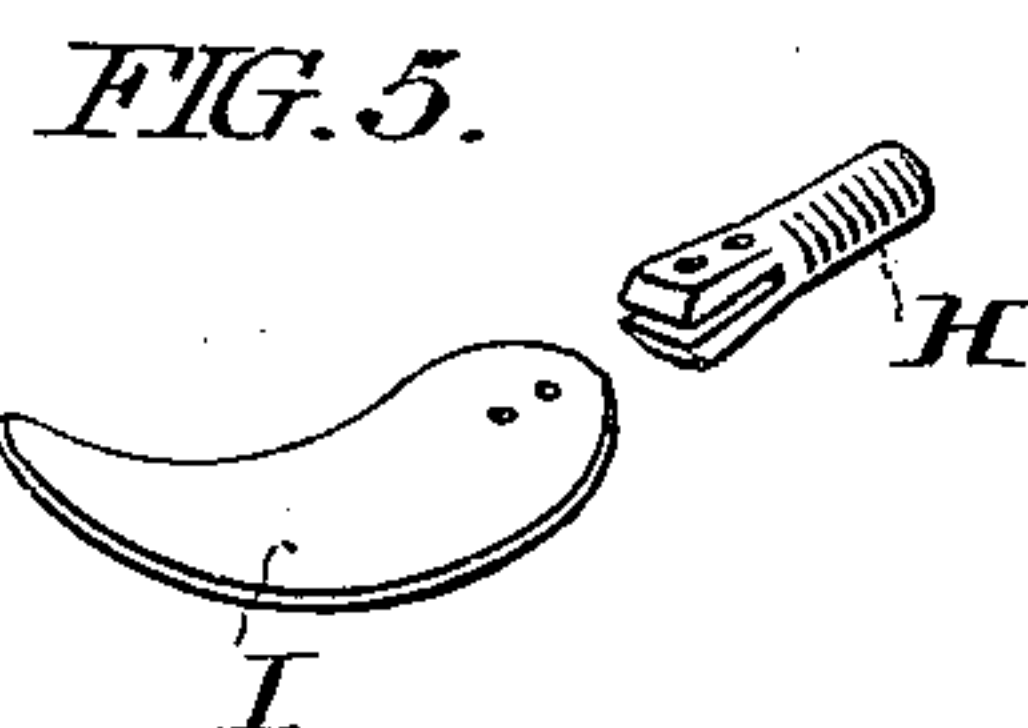
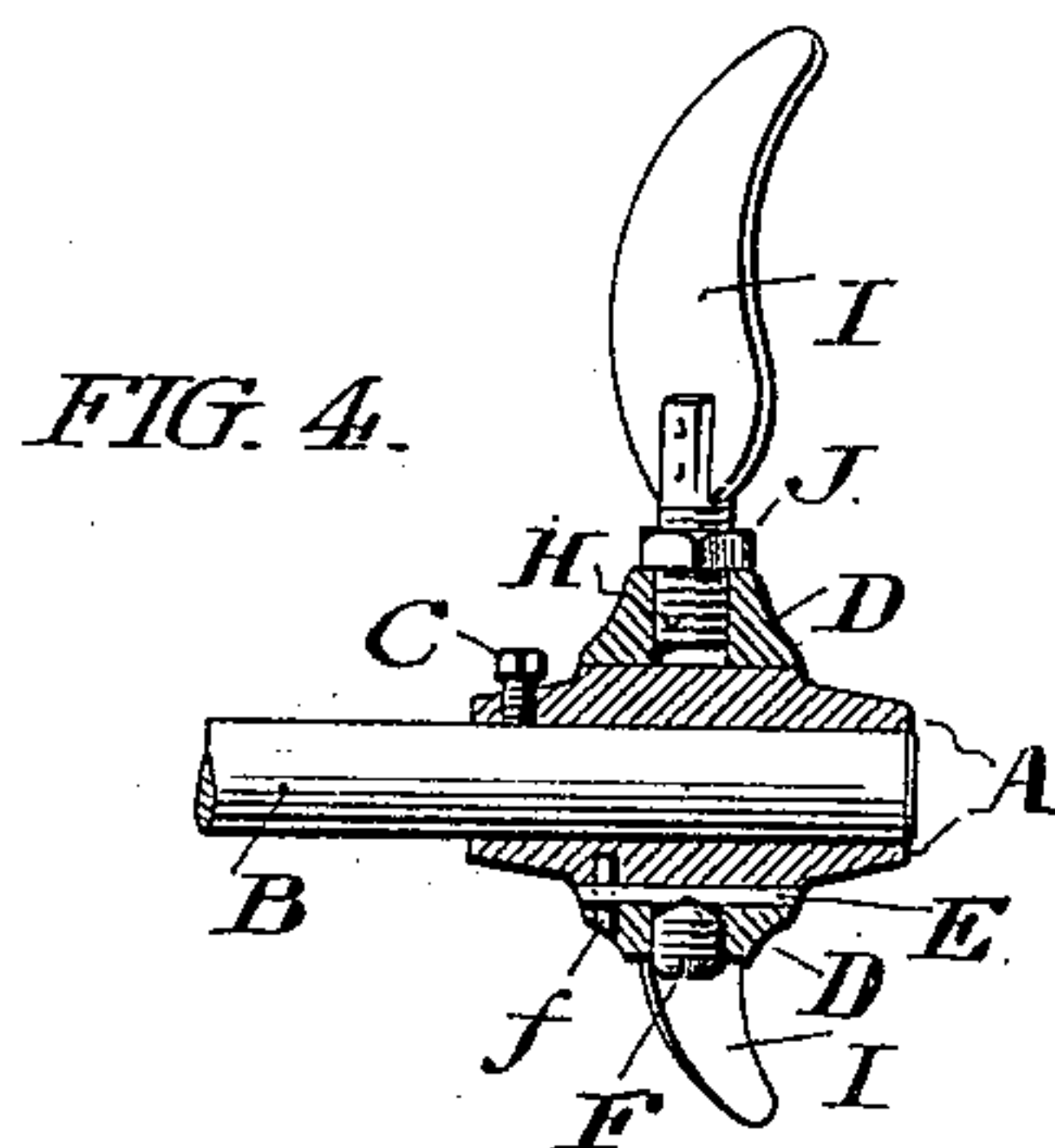
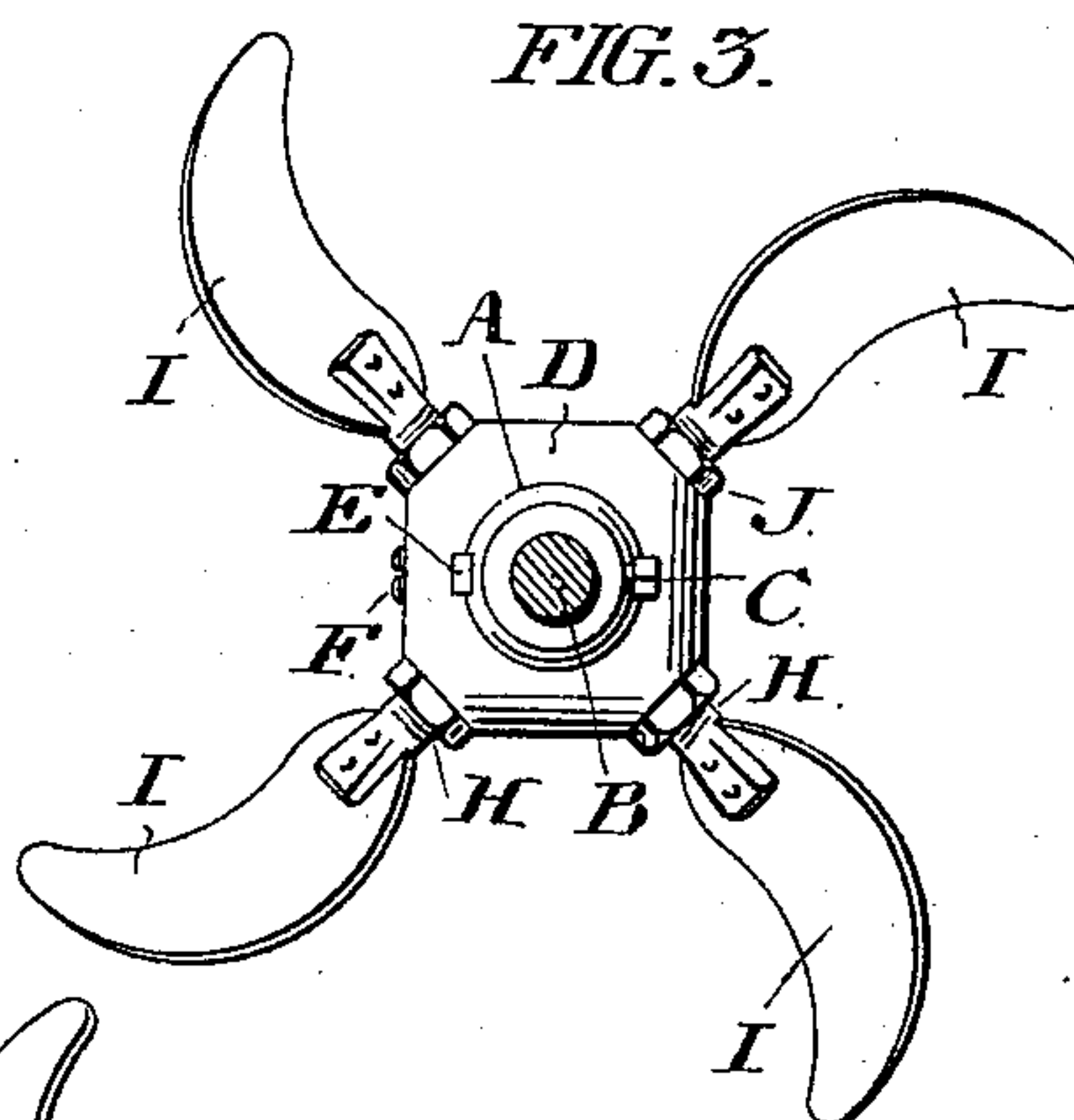
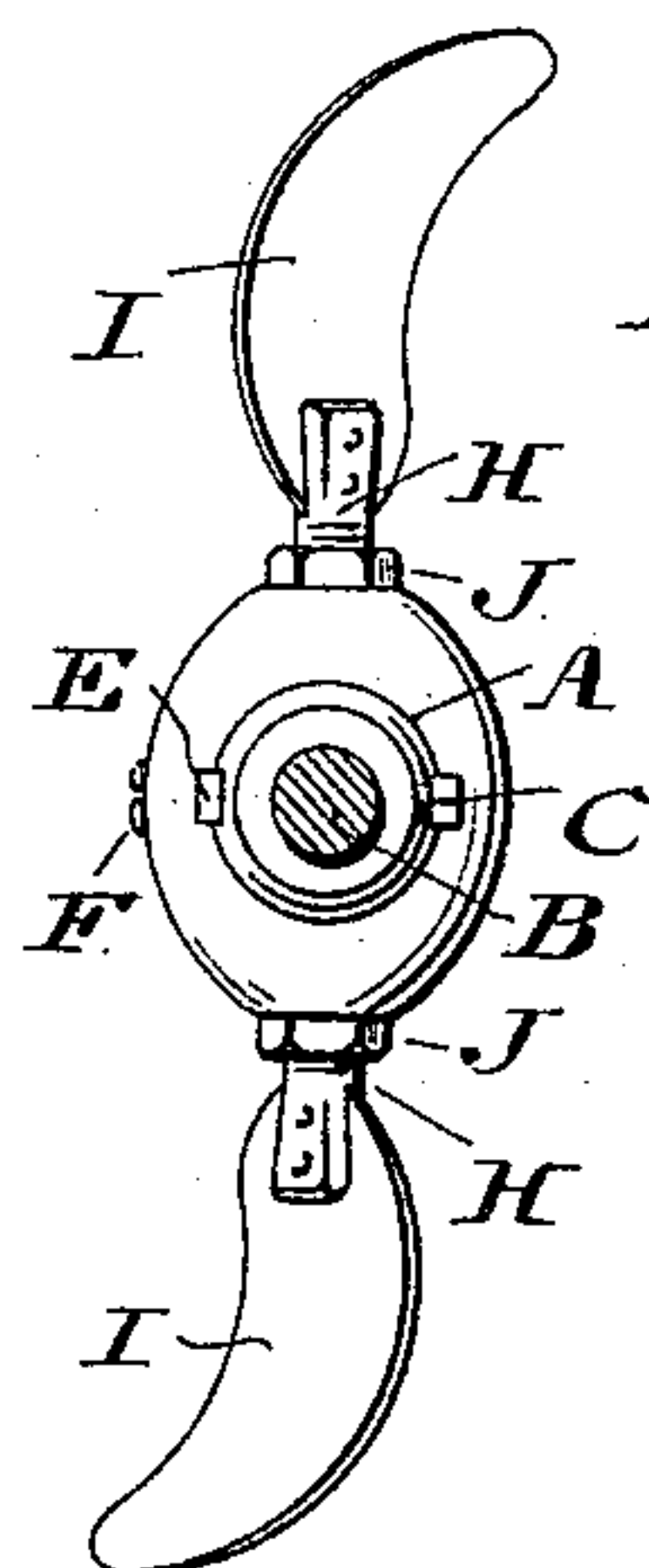
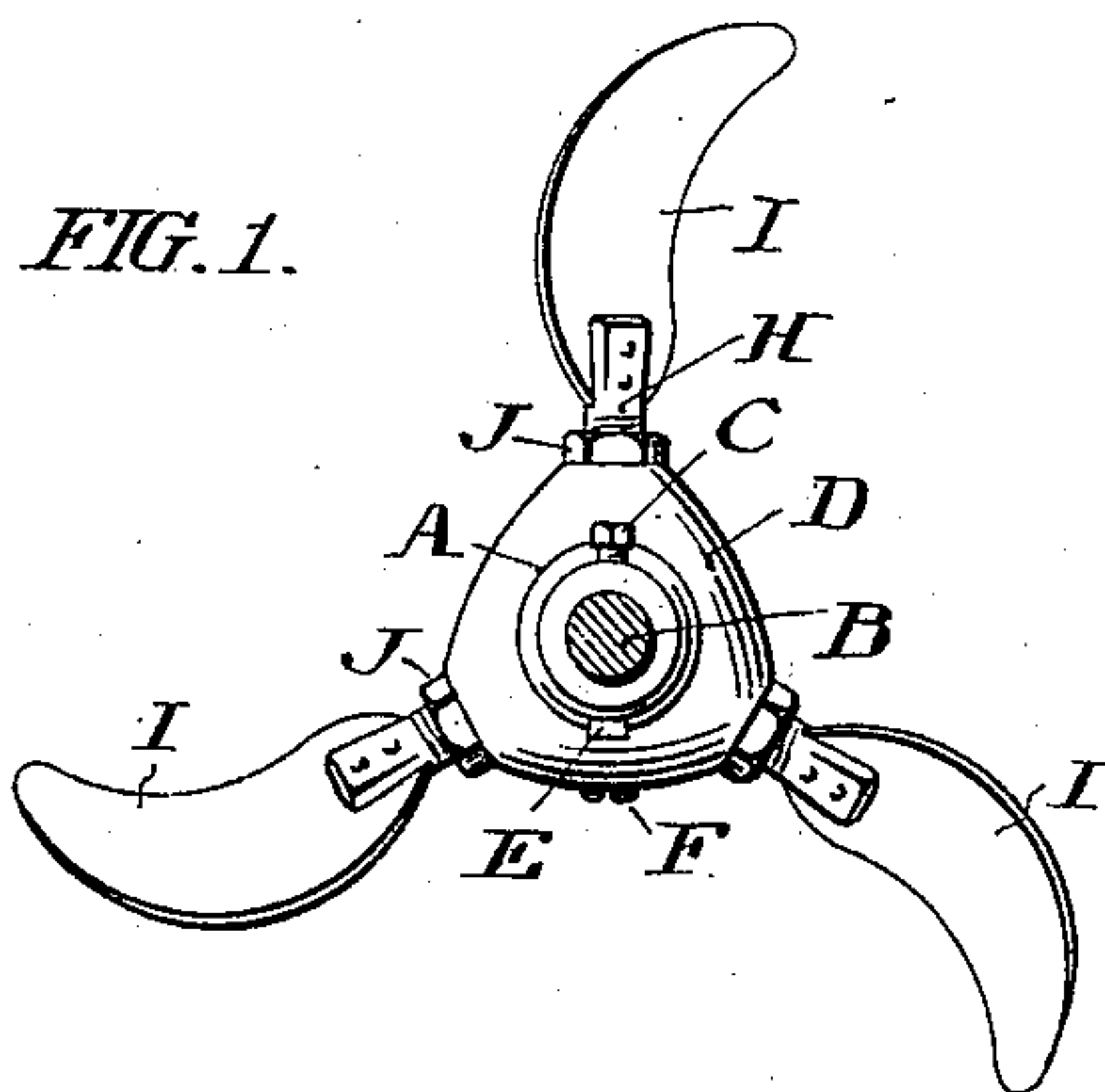
No. 620,413.

Patented Feb. 28, 1899.

J. K. BOWMAN.  
PROPELLER WHEEL.

(Application filed Oct. 12, 1897. Renewed Nov. 28, 1898.)

(Model.)



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

JOSEPH K. BOWMAN, OF GRUBBS, DELAWARE.

## PROPELLER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 620,413, dated February 28, 1899.

Application filed October 12, 1897. Renewed November 28, 1898. Serial No. 697,712. (Model.)

*To all whom it may concern:*

Be it known that I, JOSEPH K. BOWMAN, of Grubbs, Delaware, have invented certain new and useful Improvements in Propellers, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to means whereby the propeller-blades may be detachably secured in relation to an actuating-shaft, and comprises a shaft-sleeve provided with means to secure it upon said shaft, a propeller-hub fitted upon said shaft-sleeve, and means to detachably secure said hub in fixed relation with said shaft-sleeve. As hereinafter described, the individual blades comprising the propeller are removably secured in said hub and provided with means whereby they may be fixed at any desired angle of adjustment. My peculiar construction of shaft-sleeve and propeller-hub enables the operator to apply propellers having different numbers of blades, &c., upon a given shaft provided with said shaft-sleeve, and the adjustable connection of the blades in said hub enables the operator to conveniently determine the most efficient angle of said blades without removing the propeller from the shaft.

In the drawings, Figure 1 shows a convenient embodiment of my invention, wherein a hub provided with three adjustable blades is secured upon an actuating-shaft provided with a shaft-sleeve. Fig. 2 shows said actuating-shaft provided with a two-bladed propeller. Fig. 3 shows said actuating-shaft provided with a four-bladed propeller. Fig. 4 is a vertical sectional view of the form of my invention shown in Fig. 1. Fig. 5 shows in detail the construction of the propeller-blade and shank.

In the figures, A is the shaft-sleeve, conveniently fixed upon the actuating-shaft B by means of the set-screw C. The propeller-hub D is fitted upon said shaft-sleeve A, as seen in Fig. 4, and detachably secured thereon by means of the spline E. Said hub D may be secured in proper relation with said sleeve A by means of the set-screw F (shown in Fig. 4) or by a pin f, entered through said hub D and spline E into said sleeve A, as indicated in said figure.

As shown in the several figures, the propeller-hubs D may be provided with different numbers of blades I and be interchangeably secured upon said shaft B. Said blades I are preferably made of sheet metal and each adjustably secured in the hubs D by means of their threaded shanks H. Said shanks H are preferably bifurcated at their outer extremities, as shown in Fig. 5, and riveted to the blades I and are provided with jam-nuts J, so that when said shanks are rotated in proper position within the threaded sockets in the hub D said nuts J serve to secure them in said position.

It is obvious that various changes may be made without departing from the spirit of my invention. I therefore do not desire to limit myself to the exact construction thereof which I have shown and described.

I claim—

1. In a propeller, the combination with a shaft-sleeve, of means to detachably secure said sleeve upon a shaft, a propeller-hub, fitted upon said shaft-sleeve, and means to detachably secure said hub upon said sleeve, substantially as and for the purpose set forth.

2. In combination, a propeller-shaft, a sleeve mounted upon said shaft, means to fix said sleeve upon said shaft, a propeller-hub detachably mounted upon said shaft-sleeve, and propeller-blades detachably secured in said hub substantially as set forth.

3. In combination, a propeller-shaft, a sleeve mounted upon said shaft, means to detachably secure said sleeve upon said shaft, a propeller-hub fitted to said sleeve, means to detachably secure said hub upon said sleeve, blade-shanks rotatively adjustable in apertures in said hub, blades secured to the outer extremities of said shanks, and means to secure said shanks in adjusted position in said hub, substantially as set forth.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JOSEPH K. BOWMAN.

Witnesses:

S. S. WILLIAMSON,  
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