

(No Model.)

G. H. GERE.
SCREW PROPELLER.

No. 559,890.

Patented May 12, 1896.

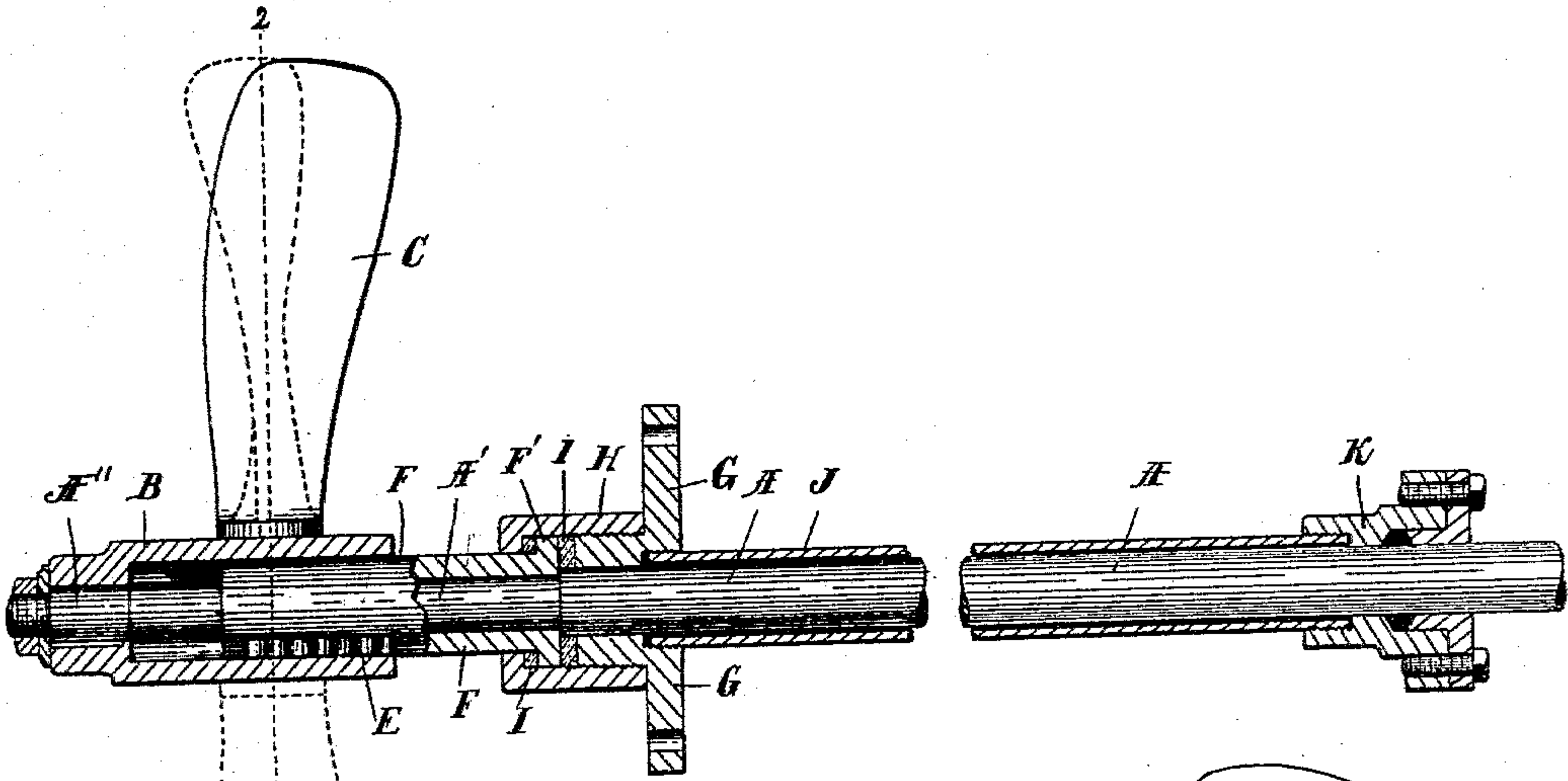


Fig. 1.

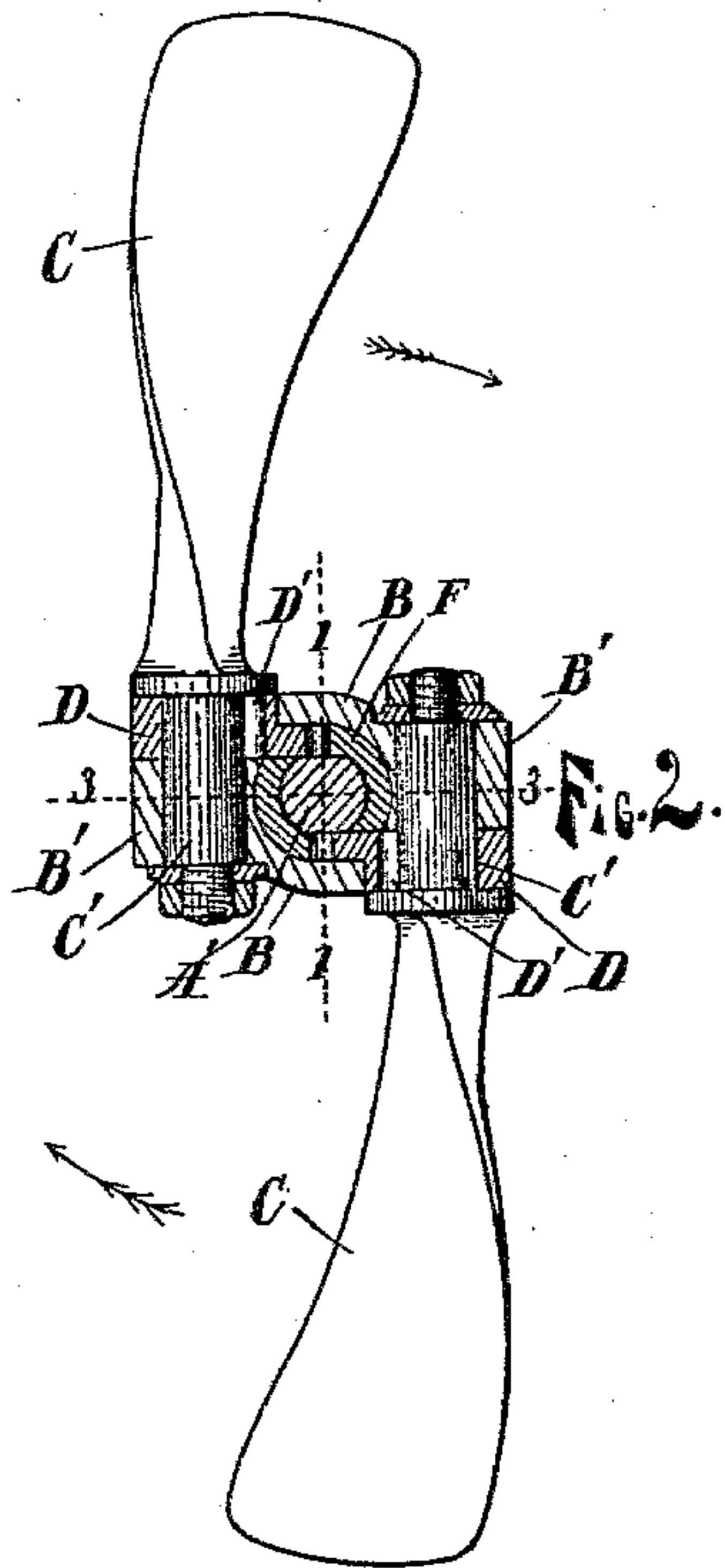


Fig. 2.

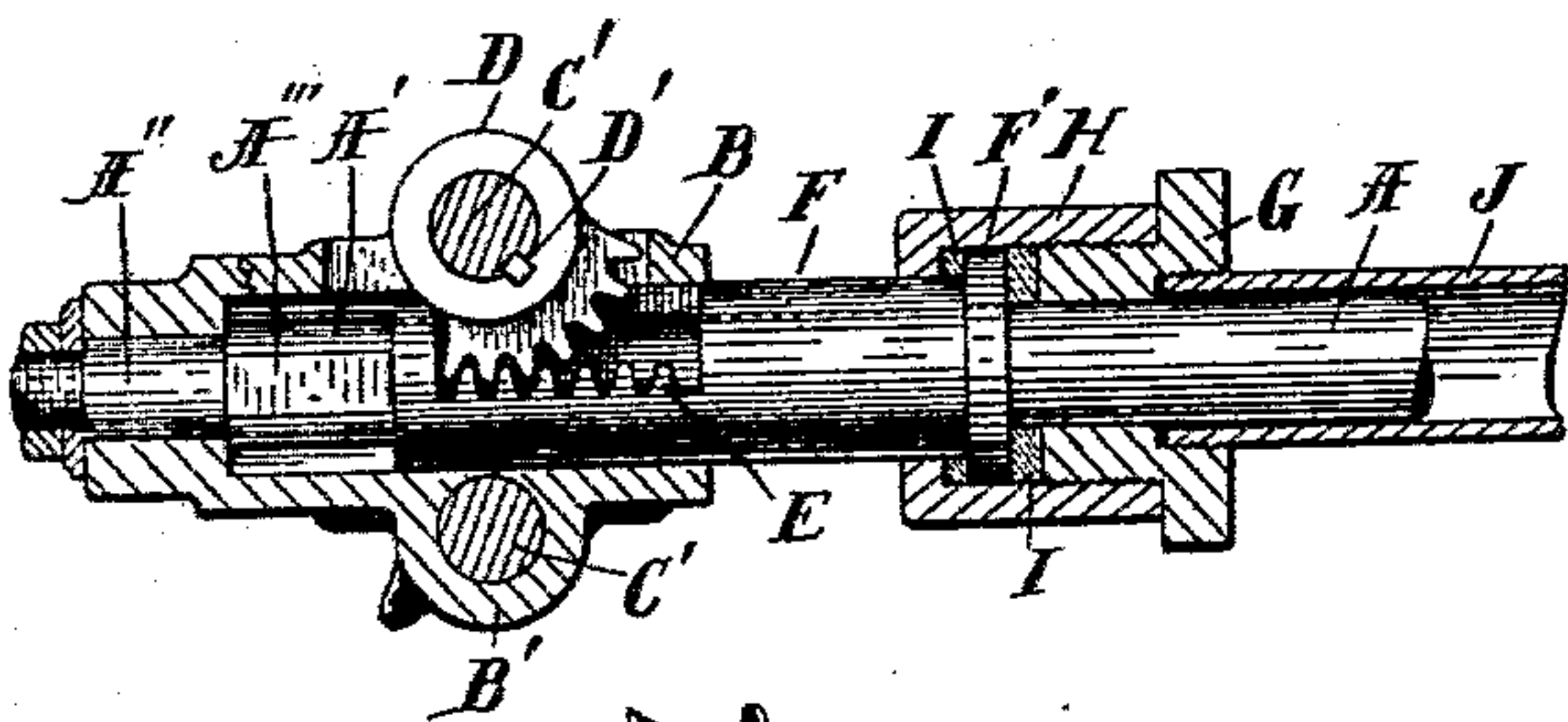


Fig. 3.

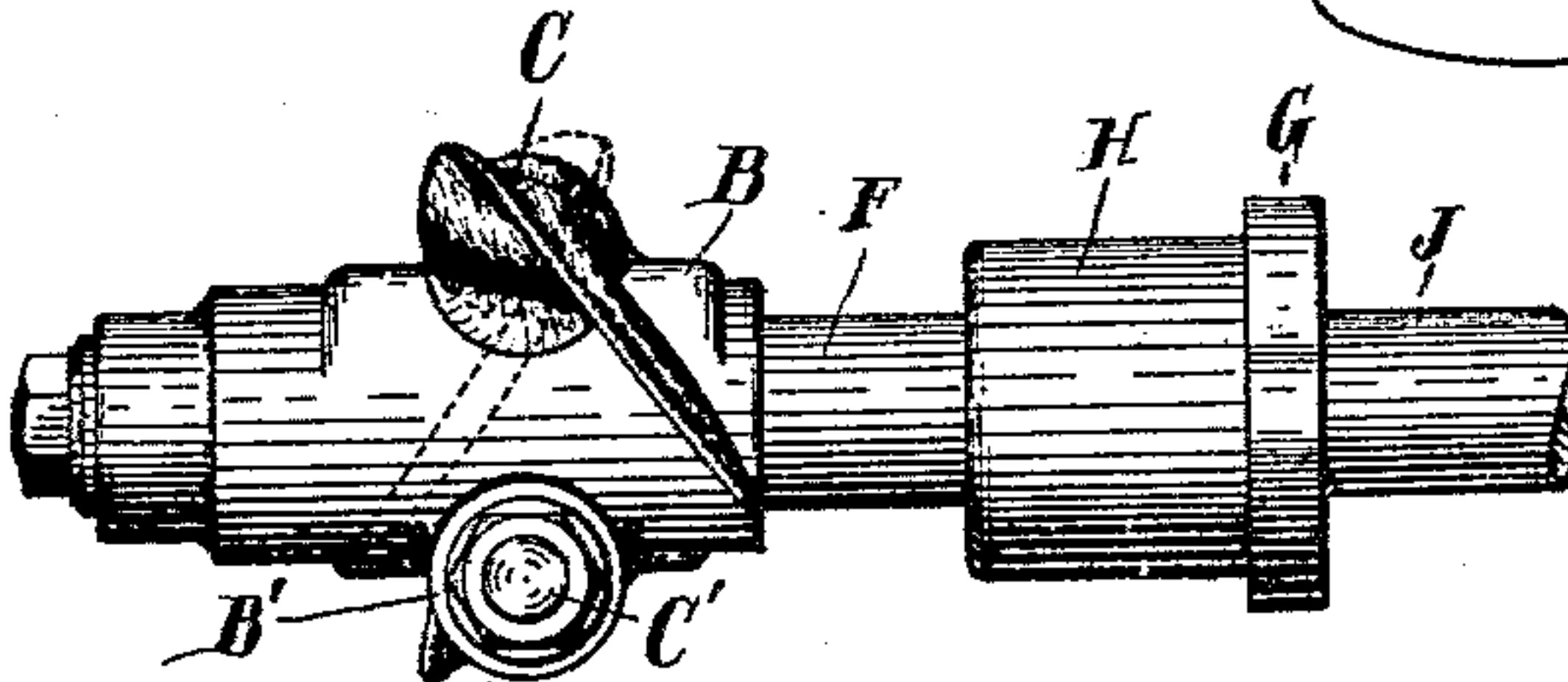


Fig. 4.

Witnesses

Lewis C. Mander
Thos. J. Graydon.

Inventor

George H. Gere
By Attorney
Luther V. Moulton

UNITED STATES PATENT OFFICE.

GEORGE H. GERE, OF GRAND RAPIDS, MICHIGAN.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 559,890, dated May 12, 1896.

Application filed September 18, 1895. Serial No. 562,834. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. GERE, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Screw-Propellers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in screw-propellers, and more particularly to that class of propellers having reversible blades, whereby the action of the same is reversed without reversing the driving mechanism, and its object is to provide the same with certain new and useful features hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a section on the line 1 1 of Fig. 2 of a device embodying my invention; Fig. 2, a section of the same on the line 2 2 of Fig. 1; Fig. 3, a section on the line 3 3 of Fig. 2, and Fig. 4 a side elevation.

Like letters refer to like parts in all of the figures.

A is a driving-shaft, adapted to be moved longitudinally from inside the boat in any suitable manner and having the reduced portions A' A'' near its end, one of said reductions, A', having flattened sides A'''. Firmly secured on said reduced portion A'', by means of a nut in the end of said shaft, is the hollow hub B, on which are journaled, in bearings B', the blades C, which blades are provided with shanks C', held in said bearings B' by means of nuts and washers. Secured to said shanks by means of splines D' are sectors D, which sectors engage with racks formed by cutting away portions of the sides of the sleeve F and forming teeth on the lower edges of the openings thus made through said sleeve. Said sleeve F engages the reduced portion A' of said shaft, which has the flattened sides A''' and has an inner surface to conform to that of the shaft, thus preventing said sleeve from turning on said shaft, but allowing a free longitudinal movement of said shaft, said sleeve being prevented from moving longitudinally by a flange F' on its inner

end, which engages a casing H, said casing being adapted to receive a screw-threaded follower G, which is attached, by means of bolts, to the boat, and interposed between said flange and casing and flange and follower are rings of fiber I to prevent friction and wearing. A sleeve J on said shaft engages a screw-threaded opening in said follower, and, extending through the boat, has a stuffing-box K on its inner end to prevent the water from entering the boat. The blades C are so constructed that the line of each axis does not pass through the center of the blade, but is farthest from the lead side, thus making an unbalanced blade.

To reverse the motion of the boat, the shaft A is moved inward, carrying with it the hollow hub B and blades C, and as said blades are connected with said sleeve by means of the racks and sectors said blades will be rotated to the position shown in dotted lines in Figs. 1 and 4 as said hub B slides over said sleeve, moving said sectors along said racks until the end of said sleeve comes in contact with the end of the cavity in said hub. To again give the boat a forward motion, said shaft is moved outward until the shoulder formed by the reduction A' strikes the inner end of the sleeve F, determining the throw of the blades.

When said propeller is revolved in the direction indicated by the arrows in Fig. 3, with said blades in their maximum positions for forward motion, there being a greater amount of surface to be contacted by the water on the lead side of the axial line of said blades, the force of said water will tend to throw said blades farther in that direction, and thus the same are held in said maximum position, and when said blades are reversed and said sides pass said axial lines the action of the water throws said blades into their maximum positions in the other direction and holds them there the same as before. I thus secure a screw-propeller having reversing blades, which blades are thrown to their maximum pitch or position by the action of the water after passing the center of throw, the water then tending to hold the blades when the wheel is rotated at the maximum pitch or position.

It will be observed that by employing a

driving-shaft having longitudinal movement as well as being revoluble, and a hub partaking of both of said movements and carrying journaled blades provided with sectors, together with a sleeve provided with racks engaged by said sectors, which sleeve is revolved by said shaft but has no longitudinal movement, the structure is made much more compact and efficient than when the shafts and blades simply revolve and the racks are made to move longitudinally.

Having thus fully described my invention, what I claim is—

1. In a screw-propeller, a longitudinally-movable driving-shaft, a rotative sleeve surrounding said shaft and having racks at each side, a hub longitudinally movable upon said sleeve and attached to the outer end of said shaft, blades journaled in said hub and moving therewith, and toothed sectors attached to said blades and engaging said racks, substantially as described.

2. In a screw-propeller, in combination with a driving-shaft having flattened sides, a sleeve having an inner surface to contact said flat-

tened sides, a hollow hub secured to said shaft, blades journaled on said hub, sectors on said blades, racks formed in the sides of said sleeve and adapted to engage said sectors, and a casing engaging said sleeve and adapted to be secured to the boat, substantially as described.

3. In combination, a driving-shaft having a reduced end having flattened sides, a hollow hub on said shaft, blades having shanks, bearings for said shanks on said hubs, sectors splined on said shanks, a sleeve having an inner surface to conform to the flattened sides of said shaft, on the same, racks on said sleeve adapted to engage said sectors, a flange on said sleeve, a casing to engage said flange, and a follower to engage said casing and adapted to be secured to the boat, substantially as described.

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

GEORGE H. GERE.

Witnesses:

LUTHER V. MOULTON,

LEWIS E. FLANDERS.