

No. 725,097.

PATENTED APR. 14, 1903.

A. W. LEARNARD.  
PROPELLER.

APPLICATION FILED FEB. 2, 1903.

NO MODEL.

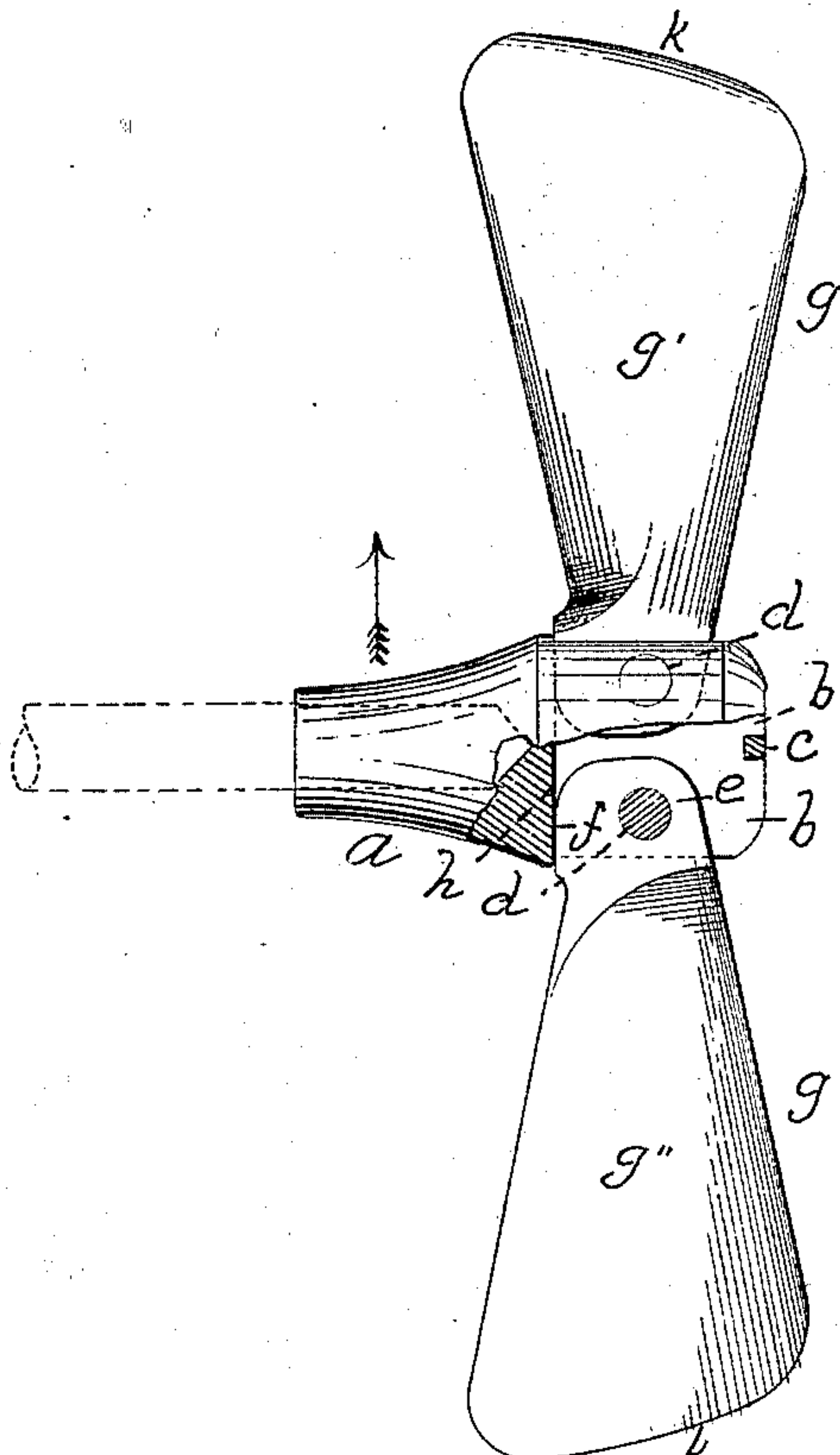


Fig. 1.

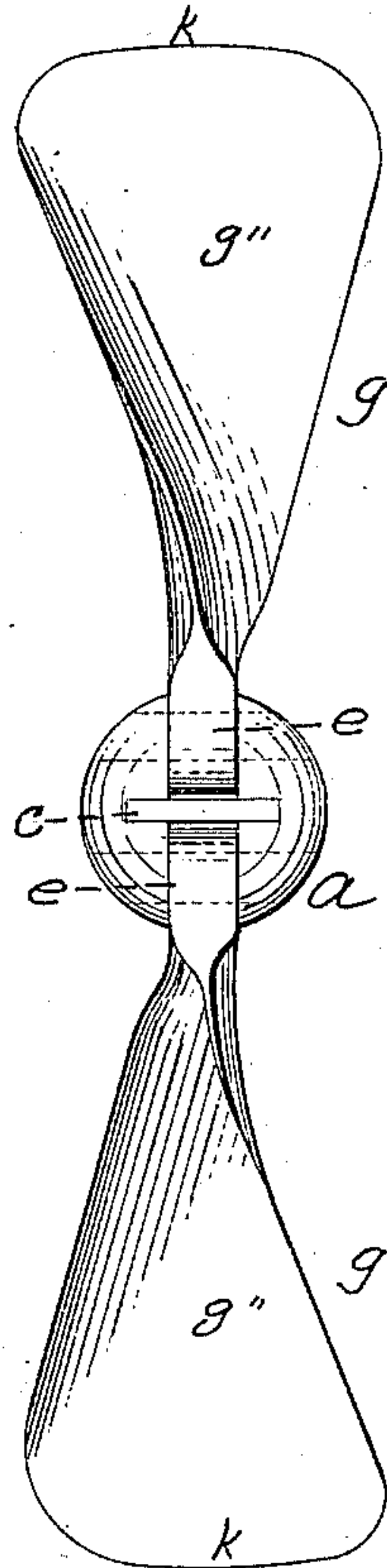


Fig. 2.

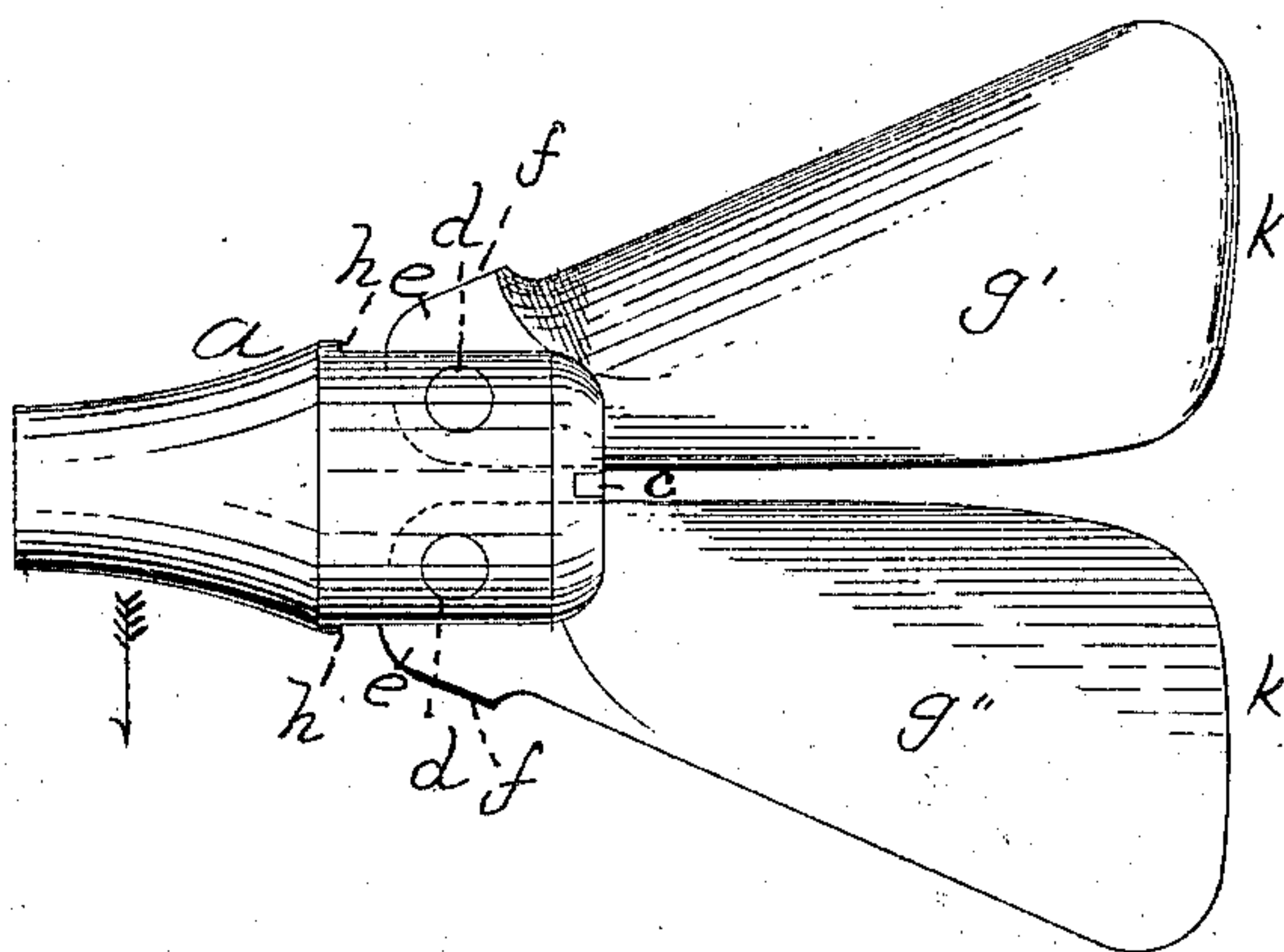


Fig. 3.

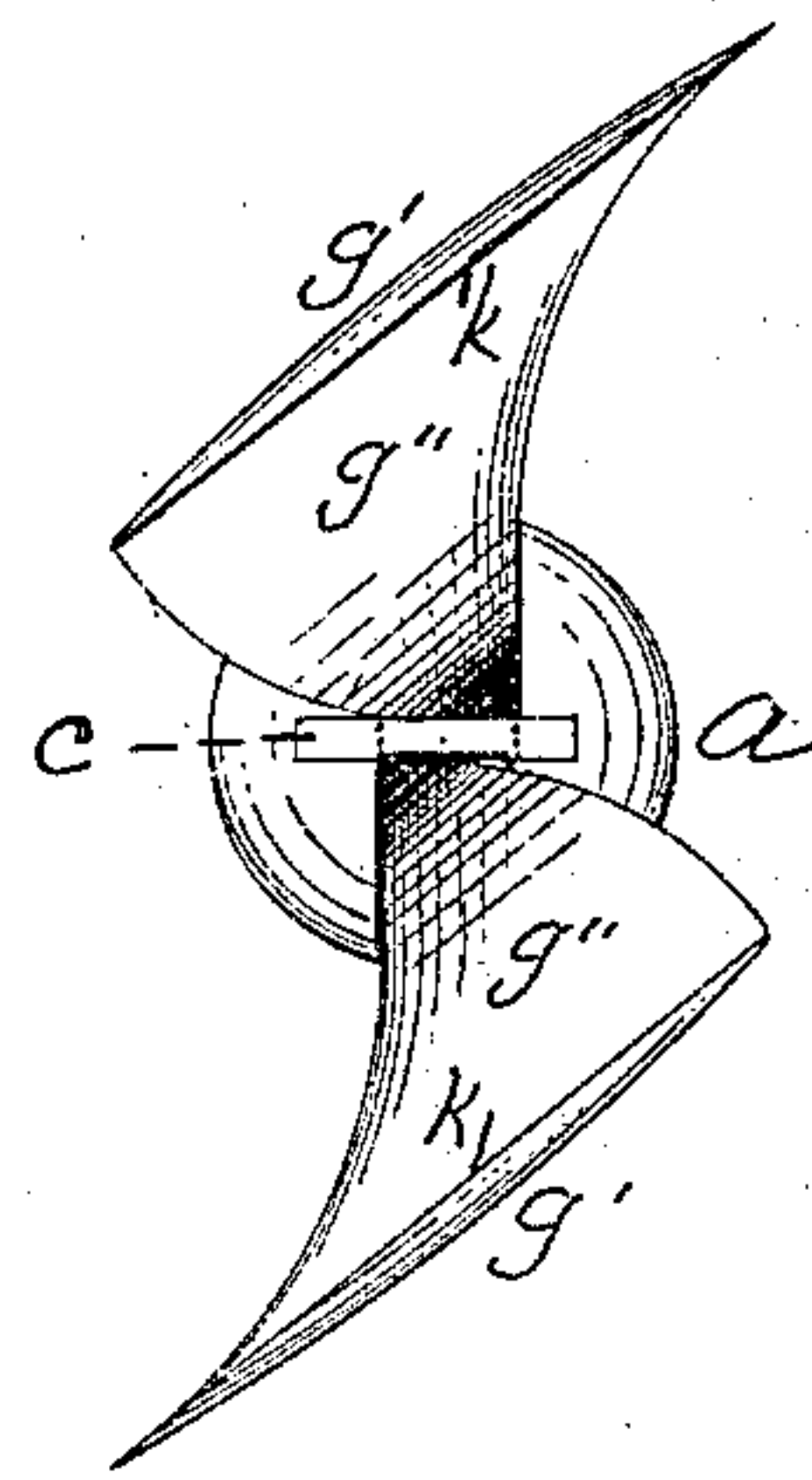


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## PROPELLER.

SPECIFICATION forming part of Letters Patent No. 725,097, dated April 14, 1903.

Application filed February 2, 1903. Serial No. 141,528. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR W. LEARNARD, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Propellers, of which the following is a specification.

This invention relates particularly to yacht-propellers, and it is intended especially for use in connection with that class of yachts which are adapted to be propelled by both sail and steam power. I do not, however, confine myself to the employment of my improved propeller in connection solely with this style of yacht or even with yachts alone, it being my intention to apply the propeller to vessels of any style to which it may be found adapted.

The nature of my invention is fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the propeller with the blades spread or open, a portion of the hub or head being represented as broken out and the position of the shaft being indicated by broken lines. Fig. 2 is an elevation of the outer end of the same. Fig. 3 is a plan view of the propeller with the blades closed. Fig. 4 is an elevation of the outer end of the same.

Similar letters of reference indicate corresponding parts.

*a* represents the hub or head, adapted to receive the rear end of the shaft. This hub is provided with opposite and substantially radial slots *b*, which practically bifurcate the outer end of the hub. A cross-bar *c* extends centrally across the continuous opening made by the two slots *b*, (which constitute, practically, a single slot,) said cross-bar being preferably located at the extreme rear end of the head, as illustrated.

Extending across the slots *b* and secured to the opposite walls thereof are pivots *d*, which extend through the shanks *e* of the blades or paddles *g*. Each of these shanks is provided with a flattened edge *f*, which when the blade is open bears against the rear wall *h* of the slots *b* and prevents the blade from swinging farther forward—that is, toward the vessel—than at substantially right angles to the axis of the hub of the propeller. The blades *g* are broadened at their outer ends and are formed

as if bent or twisted until the plane of the outer edge *k* is at a suitable angle—say from forty-five to seventy-five degrees—with the plane of the shank *e*.

In operation when the vessel is being propelled by sail-power the blades assume the closed position indicated in Figs. 3 and 4, inasmuch as the water bears upon their outer or forward surfaces *g'* and folds them until their inner edges rest against the opposite sides of the cross-bar *c*. Should the vessel, however, be under steam-power, the rotation of its shaft, and consequently of the head or hub *a*, in the direction of the arrow in Fig. 1 would cause the rear surface *g''* of the blades to press against the water, with the effect that the blades would instantly spread or swing outward into the position indicated in Fig. 1 and operate as a propeller. Should the engine be reversed and the shaft and hub be turned in the direction indicated by the arrow shown in Fig. 3, the forward surfaces *g'* of the blades would be presented to the water, thus causing them to close or fold. Hence my improved propeller operates as a propeller only when the vessel is to be propelled by steam or equivalent power; but when sail-power is to be used or when the engine is reversed it closes and becomes inoperative, both the open and closed positions being assumed automatically. It will be seen, therefore, that this device operates as a propeller only when such operation is desired; but when sail or other power independent of the propeller-shaft is employed it closes into such a position that it will produce the least possible drag in the water or obstruction to the progress of the vessel.

I do not, of course, limit myself to the exact number of blades illustrated in the drawings. As many blades may be employed as will operate freely and automatically and fold back in line with the shaft, as above described, and when the blades thus fold back they at once clear themselves from any fouling obstruction, such as sea-weed, ropes, &c.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a propeller of the character described, a hub or head adapted to be rigidly secured to the shaft; and blades pivotally secured at



their inner ends to the hub or head and adapted by their shape to spread or swing outwardly therefrom and act as propeller-blades when the shaft is rotated in the ordinary direction, and to fold inward toward each other when the shaft is reversed or the vessel is drawn through the water by sail or other power not connected with the propeller-shaft.

2. In a propeller of the character described, a hub or head adapted to be rigidly secured to the shaft; and blades secured at their inner ends to said hub or head and adapted by their shape to spread or swing outwardly and substantially radially therefrom and act as propeller-blades when the shaft is rotated in the ordinary direction, and to fold inward toward each other when the shaft is reversed or when the vessel is drawn through the water by sail or other power not connected with the propeller-shaft.

3. In a propeller of the character described, a hub or head adapted to be rigidly secured to the shaft; and blades *g* pivotally secured at their inner ends or shanks *e* to the hub or head and formed in the bent or twisted shape shown whereby the plane of their outer ends is at an angle with the plane of the shanks, said blades being adapted by such shape and

by their pivotal connection with the hub to act automatically with relation to the water and spread or swing outwardly and operate as propeller-blades when the shaft is rotated in the ordinary direction, and to fold inward toward each other when the shaft is reversed or when the vessel is drawn through the water by sail or other power not connected with the propeller-shaft.

4. In a propeller, the hub or head provided with the longitudinal grooves *b*, and with the cross-piece *c*; and the propeller-blades *g* pivotally secured at their inner ends to the head within said grooves, and adapted when the shaft is rotated in the ordinary direction to swing outward at substantially right angles with the axis of the hub or head, and when the shaft is reversed or the vessel is propelled by sail or other power independent of said shaft, to fold inward against the said cross-piece.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR W. LEARNARD.

Witnesses:

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A. N. BONNEY.