

Goodier & Milshaw, Paddle Wheel.

N^o 55,439.

Patented Jun. 5, 1866.

Fig. 1.

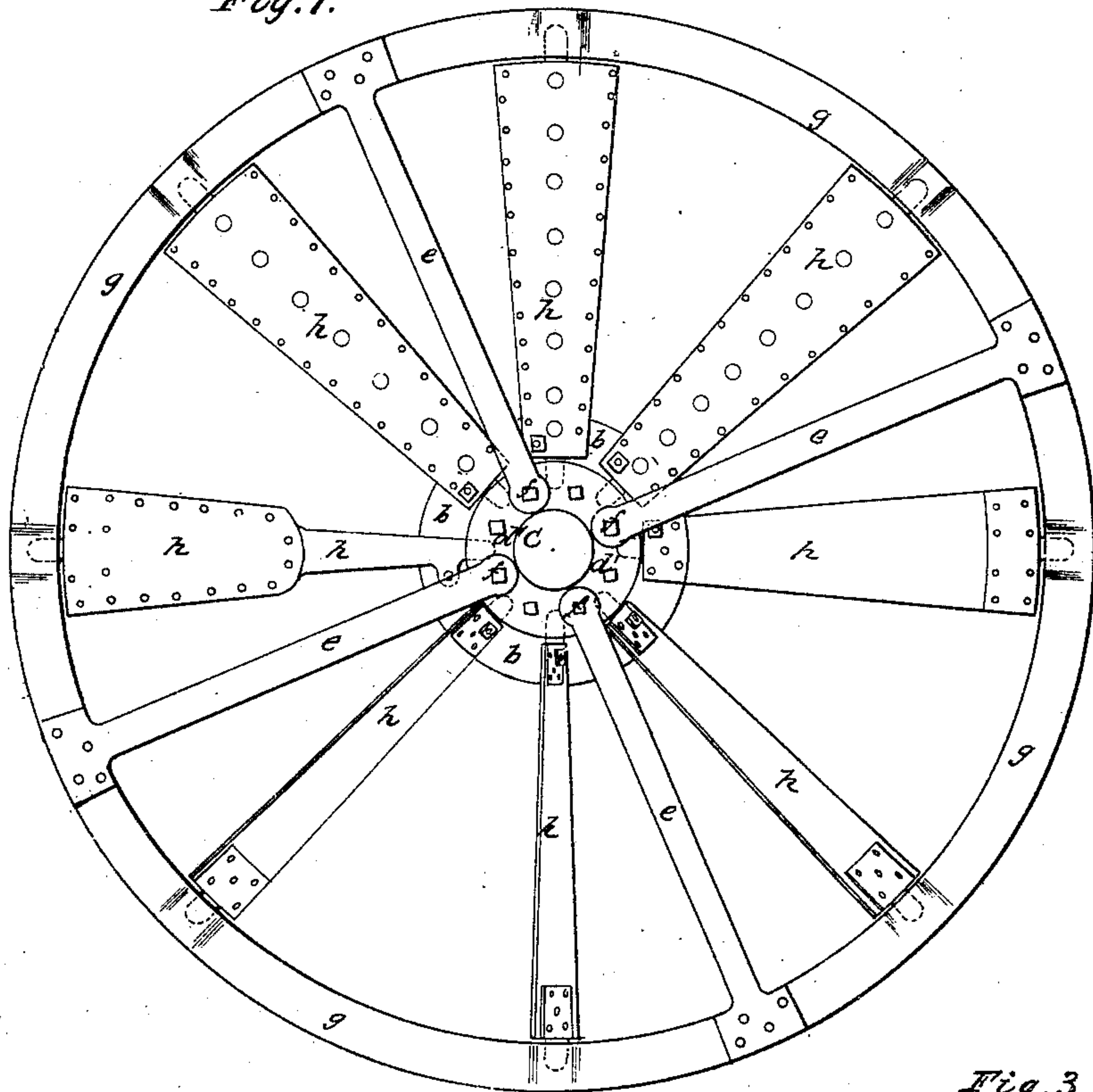


Fig. 2.

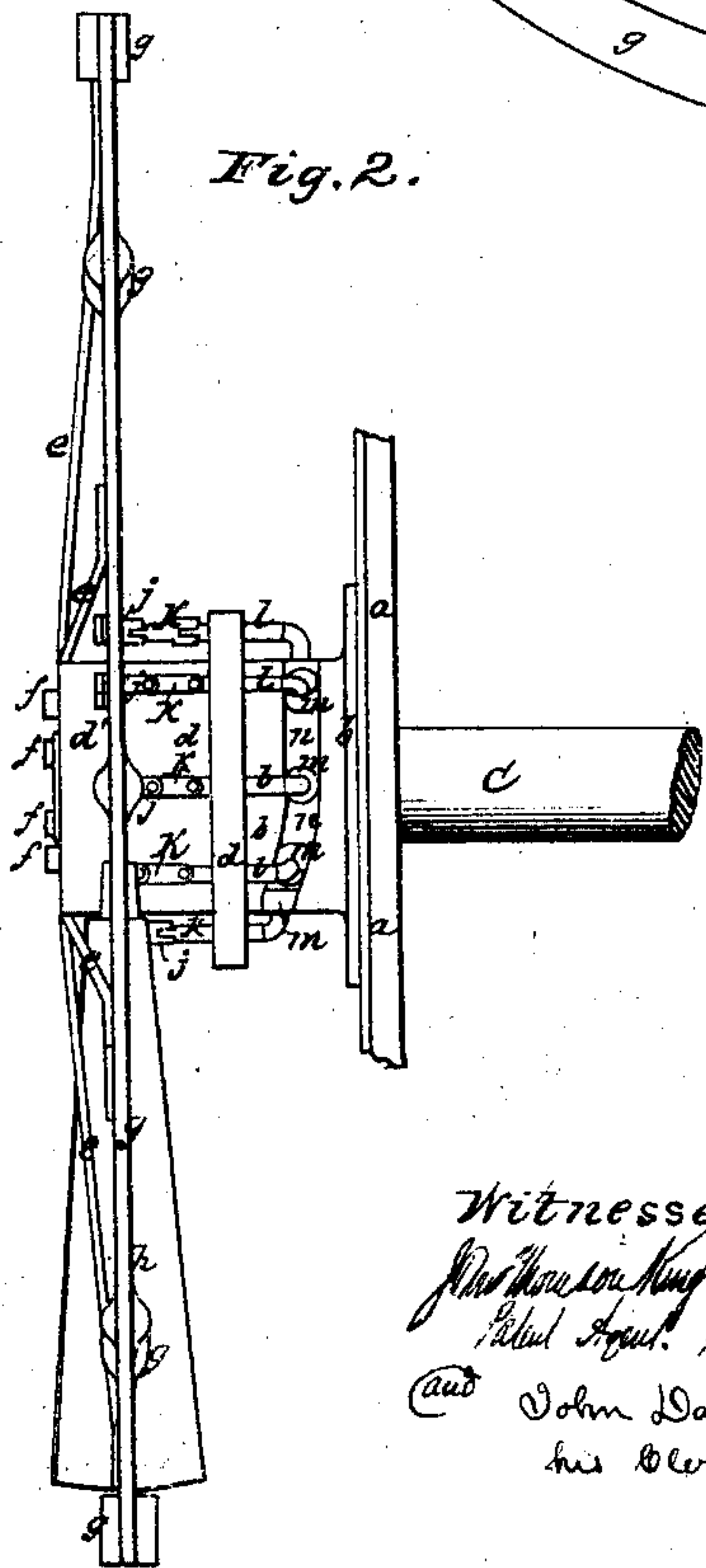
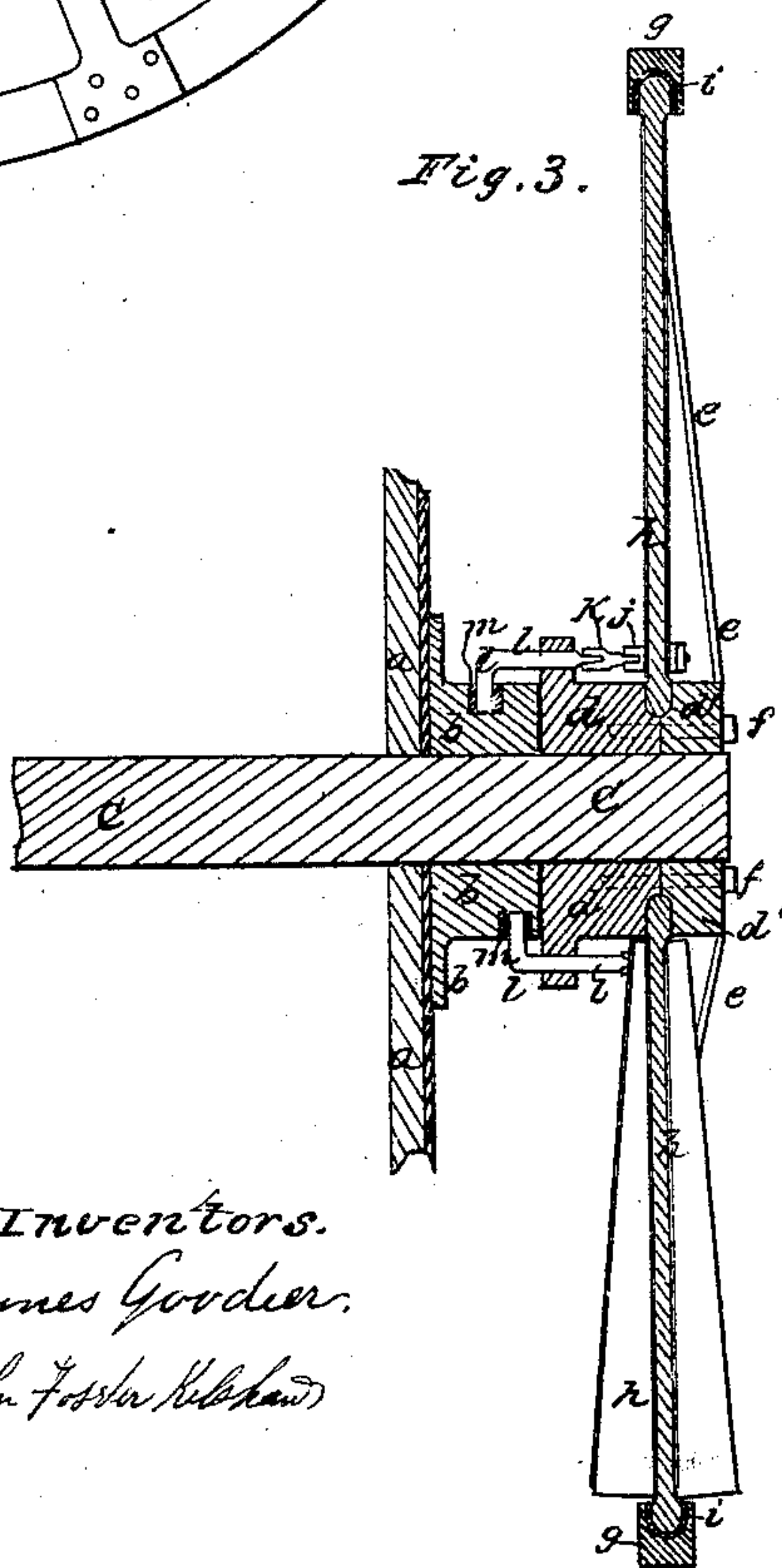


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

JAMES GOODIER, OF CHESTER, AND J. F. KILSHAW, OF NEW BRIGHTON,
ENGLAND.

IMPROVED PADDLE-WHEEL.

Specification forming part of Letters Patent No. 55,439, dated June 5, 1866.

To all whom it may concern:

Be it known that we, JAMES GOODIER, of Chester, in the county of Chester, miller, and JOHN FOSTER KILSHAW, of New Brighton, in the aforesaid county of Chester, cordwainer, both in that part of her Britannic Majesty's dominions called England, have invented certain new and useful Improved Means for Feathering the Paddles or Floats of Side Propellers for Navigable Vessels; and we do hereby declare that the following is a full and exact description of the construction and operation thereof, reference being had to the accompanying sheet of drawings, making a part of this specification, and the figures and letters of reference thereon—that is to say:

The class of side propellers which our improved means or mechanical parts are intended to operate is that in which the lines of the axes whereon the paddles or floats move extend radially from the line of the main or driving shaft at or about right angles therefrom—that is to say, the paddles or floats are set to enter the water edgewise, the line of the edge of each as it enters being parallel to the keel of the ship, then made to turn or feather and offer their surfaces of greatest area to act on or displace water, and thereafter to turn or feather back, so as to leave the water edgewise. The angle to which the paddles or floats are or may be made to feather when deepest in the water should be suitable to the build or shape of the ship. In ships with lines of average fineness, the propellers being in the usual positions at the sides, we have found an angle of thirty degrees to the line of the keel to answer well.

The accompanying sheet of drawings shows our improved means in working position with a propeller of the kind above mentioned. As such propeller is not in general use we will, that our invention may be more readily understood, describe it hereinafter.

Figure 1 is an elevation as seen when looking toward the side of a ship; Fig. 2, an elevation as seen when looking along the side of a ship, and Fig. 3 a vertical section of Fig. 2.

In all these views like letters denote the same parts.

a represents part of a ship side to which a metal block or cam, *b*, is secured by bolts and

nuts or other means. The driving-shaft *c* rests in and passes through *b*, and on its outer end there is secured, by keys or otherwise, the boss-pieces *d d'*, from which the frame-arms *e*, fastened by screw-bolts *f*, radiate. These arms *e* are fastened at their outer ends to the rim or ring *g*—they might be forged with it in one piece.

Between *d* and *d'* are recessed spaces for the inner ends of the paddles or floats *h*, and the outer ends rest in bearings therefor, formed in the rim or ring *g*. It will be observed that the recessed spaces for or the inner bearings are between *d* and *d'*, for convenience in shipping the paddles or floats *h*, but it will be obvious that *d* and *d'* might be made in one piece if openings were made in the rim or ring *g*, such as could be secured when the paddles or floats were placed in position. The paddles or floats *h* can be made entirely of metal, or of part metal and part wood.

In the drawings, the three highest are constructed each with a solid axis passing from end to end and with thin plates on each side, the parts being fastened together by through-rivets. In the one on the left part of the plates are cut away, and in the remaining four wood is used, the metal end pieces having palms, shown secured to the wood by through bolts or rivets. We prefer the construction first described, as the water will be the lubricant used, if not for both outer and inner ends and bearings, at least for the former. Such bearings (marked *i*) may be made of hard wood—say lignum-vitæ.

To the paddles or floats, at their sides and laterally from their axes, there are secured gabs *j*; nuts are shown as the fastenings, but other means may be employed. Connecting-links *k* are shown, coupled by pins to *j* and to elbow-pieces *l*. These latter, where they pass through the openings in flange *d*, are of a rectangular or other angular form in transverse section, and the said openings are of like form, the object being to make these parts act as guides and prevent oblique strain.

The inner ends of *l* are provided with friction-rollers *m* to run in the groove *n*. The upper part of that groove follows the course of a true ring, while the lower portion diverges

laterally from that form, but it is obvious the shape might be varied. Parts *j*, *k*, *l*, and *m* should be made of cast-steel.

The operation of the parts is as follows:

When the driving-shaft *c* is made to rotate the boss-pieces *d* and *d'*, and all the parts connected thereto, are carried round by and with it. The elbow-pieces *l*, with their friction-rollers *m*, are compelled to run in the groove *n*, and as they approach the lowest point of the lateral diverging portion they are forced to move outward, and by the links *k* and gabs *j*, push the paddles or floats to the angle at which they are set to feather, so as to take a good hold of the water and thereby propel the ship. So soon as the friction-rollers pass the lowest portion of *n* they, and the elbow-pieces *l*, links *k*, and gabs *j*, are drawn back, and the paddles or floats *h* made to feather or move back and leave the water edgewise.

Having now given a full and exact description of our invention, and mentioned the materials of which we consider the parts should be made, we would have it understood that we

do not confine ourselves to the use of the particular material mentioned, nor to the exact proportions or disposition of all the parts, as many modifications in detail might be made without departing from the leading features of our invention.

What we claim as improved means for feathering the paddles or floats of the kind herein described is—

The cam or piece *b*, with groove *n*, elbow-pieces *l*, links *k*, and gabs *j*, arranged and operated substantially as herein specified.

Signed and sealed by the said JAMES GOODIER and JOHN FOSTER KILSHAW, at Liverpool, in the county of Lancaster, in the Kingdom of England, this 9th day of January, A. D. 1866.

JAMES GOODIER. [L.S.]

JOHN FOSTER KILSHAW. [L.S.]

Witnesses:

JOHN THOMSON KING,

Patent Agent, Liverpool.

JOHN DAVIES,

His Clerk.