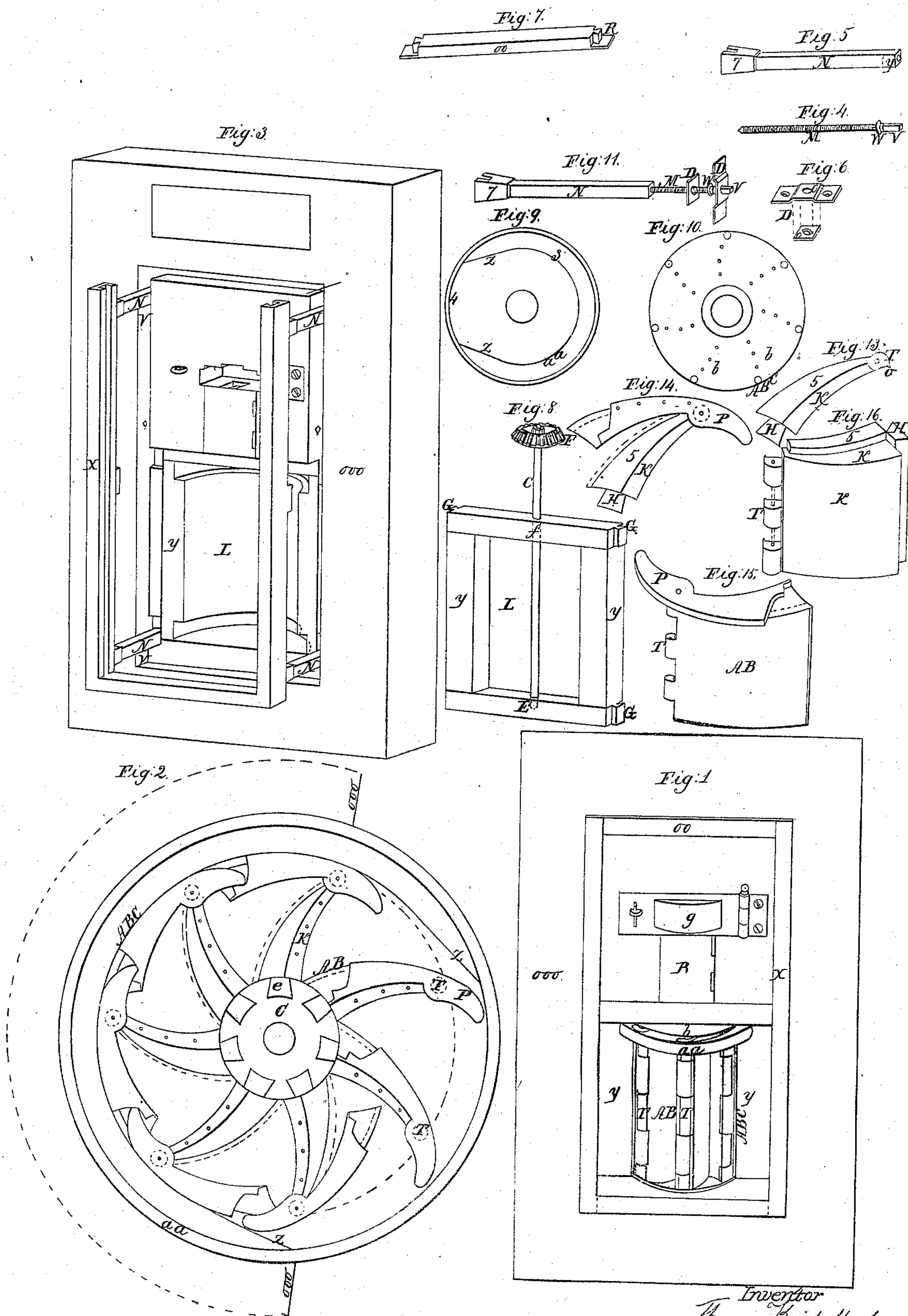


*T. Kendall, Sr.*  
*Hydraulic Propeller.*

*Nº 17,156.*

*Patented Apr. 28, 1857*



*Inventor*  
*Thomas Kendall Sr.*



# UNITED STATES PATENT OFFICE.

THOMAS KENDALL, SR., OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN SUBMERGED PROPELLING-WHEELS.

Specification forming part of Letters Patent No. **17,156**, dated April 28, 1857.

*To all whom it may concern:*

Be it known that I, THOMAS KENDALL, Sr., of the city and county of San Francisco, in the State of California, have invented a new and useful Improvement in Propelling-Wheels for Steam-Vessels; and I hereby declare that the following is a full and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 shows a section of the wheel and of the frame by which it is supported; also two doors B and *g*, which are made to close over the shaft and pinion or crank by which the wheel is put in motion. Fig. 2 is a vertical or end view of the wheel in its open position and with the cam-plates attached. Fig. 3 represents a portion of the side of a vessel with a semi-cylindrical niche therein; also, in perspective, the frame by which the wheel is to be supported within the said niche. Figs. 4, 5, 6, and 11 represent one of the hollow (female screw) beams with its respective screw, (upon which is a hub or flange, to which are fitted a pair of plates to be attached to the side of a vessel, while the square end of the screw extends through to the interior,) whereby the frame, Fig. 3, is connected to the vessel. Fig. 7 is the cap or head-beam of the frame. Fig. 8 is a perspective view of the wheel-frame with shaft and pinion. Fig. 9 is a concentric ring, to which is attached a curved plate, by means of which the positions of the curved wings are governed. Fig. 10 is a cylinder-head constituting one end of the wheel. Fig. 13 is a section of one of the arms. Fig. 14 represents an arm with a wing connected. Fig. 15 is a perspective view of one of the wings with a cam-plate attached. Fig. 16 is a perspective of one of the leaves or arms, with its hinge-joint to match that of the wing.

This propelling-wheel is constructed by connecting to the outward ends of four radial arms or leaves K, by hinge-joints, four curved wings A B, which in their open position extend from each arm to the next preceding arm, thus constituting the periphery of a cylinder; but when not required in that position for that purpose they fall back against their respective arms, (which are also curved,) and in this position they constitute the paddles which act upon the water for the purpose of propulsion.

The position of the axle of this wheel is ordinarily vertical, and the wheel is designed to occupy a semi-cylindrical niche in the side of the vessel, one-half of the diameter projecting outside. It is mounted upon a frame G *y*, which is connected to the vessel by two or four horizontal screws M, whereby it may be occasionally drawn toward the vessel or projected therefrom, and this frame is supported by other frame-work X N, by means of which the wheel may be occasionally hoisted up to the deck of the vessel, the frame G *y* being guided by two grooved posts or guides.

My principal improvement consists in the mode of feathering or changing the positions of the wings A B, and which I shall proceed to describe explicitly. To the upper end of each wing is attached a cam-plate P, which extends outward or rearward of the hinge-joint T, and outside of this is firmly fixed a concentric ring *a a*, to the inside of which is attached a curved plate Z, which extends concentrically half (or more) of the circumference of the ring and nearly in contact with the periphery of the wheel. From the two ends of the interior curve of the plate (or imperfect circle) the plate slopes gradually to the external ring *a a* for the purpose of producing when the wheel is in motion an easy transition of the cam-plates from the exterior to the interior circle, and vice versa; and by these transitions the positions of the wings are changed alternately, and each wing at proper intervals falls centerward, so as to encounter the resistance of the water, and then expels the water outward and backward from the spaces between the arms as the wing changes its position to enter the niche in its segmental or peripheric form.

What I claim as my invention, and desire to secure by Letters Patent, is—

The means herein described of feathering or changing the positions of the wings, consisting of the cam-plates P, concentric ring *a a*, and curved plate Z Z, with its slopes or planes, the whole being arranged and operating substantially in the manner herein described.

THOMAS KENDALL, SR. [L. S.]

In presence of—

F. I. THIBAUT,  
E. B. BONNY.