

T. CULLEN.
Feathering-Paddle-Wheel.

No. 202,523.

Patented April 16, 1878.

Fig. 1.

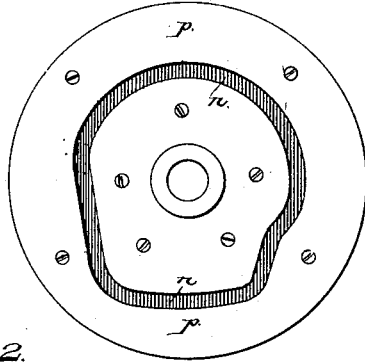


Fig. 2.

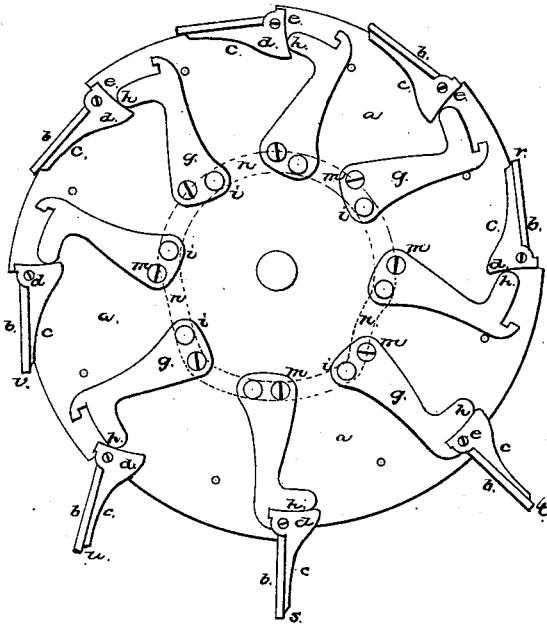
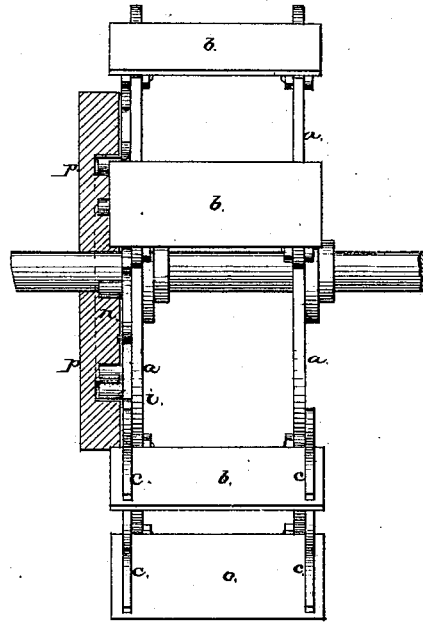


Fig. 3.



Attest:

J. B. Hyde
Charles H. Haver

Inventor:

Thomas Cullen

UNITED STATES PATENT OFFICE.

THOMAS CULLEN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO BENJAMIN T. BABBITT, OF NEW YORK, N. Y.

IMPROVEMENT IN FEATHERING PADDLE-WHEELS.

Specification forming part of Letters Patent No. 202,523, dated April 16, 1878; application filed December 27, 1877.

To all whom it may concern:

Be it known that I, THOMAS CULLEN, of the city of San Francisco and State of California, have invented certain new and useful Improvements in Paddle-Wheels for Steam-Vessels, which improvements are fully set forth in the following specification and accompanying drawings.

As ordinarily employed, the paddles of steamboat-wheels are fixed and secured radially around the wheel, and in their action they occasion loss of power from necessary lifting of the water in their upward motion, and for other well-known reasons which need not be described in this paper.

My improvement consists in suspending the buckets from oscillating centers at the ends, so that, through the agency of a simple and strong contrivance, the buckets are made to turn the planes of their surfaces relatively with the periphery of the wheel as it leaves the water, while they enter the water in the usual radial manner. In other words, the buckets take the water in line with the axis or center of motion, and in leaving the water are feathered downward, so that they form a tangent with the curve of the wheel. (See drawing.)

Figure 1 shows side view of a plate strongly secured to the sides of the vessel, or vessel and opposite frame-work of the wheel-house. Fig. 2 represents a side elevation of the wheel, with the buckets in their position as at work; and Fig. 3 shows an edge view of the same.

a represents the side of the wheel, which practically should be of strong frame-work of wood or iron. *b* show the paddles or buckets in their proper position when at work, and secured to oscillating lugs *c* at either end, which are suspended upon strong bolts *e*, upon which the lugs swing with freedom of action by their own gravity.

The inner ends of the lugs are made wide enough and of proper thickness to form a lever and bearing-surface, *d*, nearly at right angles with the paddle, and made to actuate the paddle through the agency of a peculiarly-shaped plate and compound pawl, lever, and locking device, *g*, by its operating-foot *h* and a strongly-secured stud, *i*, which may also carry a friction-sleeve, as it takes easily into the grooved channel *n*, and causes the

pawl *g* to oscillate upon the fixed bolt and center of motion *m*, so that, as the wheel rotates, the studs *i* cause the pawls to move and force the operating-foot *h* against the lever *d*, and push the lug *c* with its paddle from a tangential to a radial position, as shown at *r* and *s*, in which it is securely fastened by a projecting stud on the heel of the lever *d* taking into and interlocking with a corresponding recess in the heel of the pawl *g*, as shown at *s* and *r*.

The operation of these several devices will be readily seen. As the wheel is being rotated by the engine, and the studs *i* follow the curves of the channeled recess *n* in the fixed plates *p*, and while the paddles lie collapsed in tangential recesses cut away from the periphery of the wheel-frame, the recess *n* is so shaped that when a bucket arrives at the horizontal line on the downstroke of the wheel the pawl *g*, as at *r*, will press against the lever *d*, forcing out the paddle and locking it fast, as at *t*. It will then move about sixty degrees of its curve and through the water, when, arriving at *u*, the stud passing into the upward line of the recess *n*, it unlocks *c* from *g*, and leaves the paddle free, as seen at *v*, in which position it rests for about three hundred degrees of the circle of motion.

The periphery of the frame-work is cut away eccentrically at intervals, corresponding with the number of the paddles, and forming gradually-depressed recesses, terminating with radial cuts or shoulders, against which the buckets rest when distended for work, and also securing them when the motion of the wheel is reversed for backing water.

I am aware that feathering paddle-wheels have been constructed wherein the relative positions of the paddles are changed through the medium of comb-plates and rods that actuate the feathering motions; but

I claim—

The studded oscillating plates *g*, combined with the comb *n* and the paddle, carrying oscillating and locking lugs *c*, constructed and operated in the manner substantially as set forth.

THOMAS CULLEN.

Witnesses:

J. B. HYDE,
CHAS. G. HEISER.