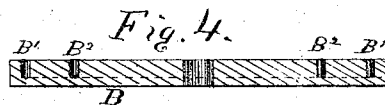
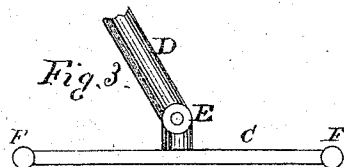
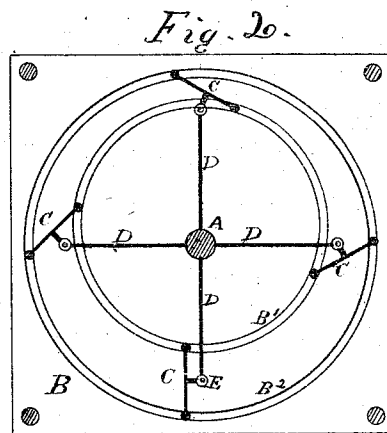
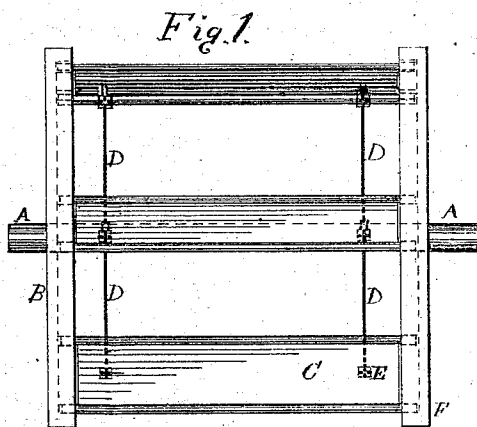


G. H. SWAN.
Feathering Paddle-Wheels.

No. 156,445.

Patented Nov. 3, 1874.



A. Schaats

WITNESSES

INVENTOR

Laura Hubbell

George H. Swan
by A. Schaats At.

UNITED STATES PATENT OFFICE.

GEORGE H. SWAN, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN FEATHERING PADDLE-WHEELS.

Specification forming part of Letters Patent No. 156,445, dated November 3, 1874; application filed April 8, 1872.

To all whom it may concern:

Be it known that I, GEORGE H. SWAN, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Feathering Paddle-Wheels, of which the following is a specification:

My invention relates to that well-known class of feathering paddle-wheels in which the buckets, as the wheel turns, are caused to vary their relation to the shaft, to cause them to enter the water without shock, to exert their maximum effect while submerged, and to leave the water with the least practicable resistance. The nature, object, and subject matter of my improvements are hereinafter specified.

In the accompanying drawings, which represent so much of my improved paddle-wheel as is necessary to illustrate the invention herein claimed, Figure 1 represents a front view, and Fig. 2 a vertical section on the line *x x* of Fig. 1. Fig. 3 shows a section through one of the guide-frames, and Fig. 4 an end view of one of the paddles and its arm.

The main shaft A is mounted in suitable bearings in fixed frames B B, provided with annular grooves B¹ B² for guiding the buckets or paddles. The outer or larger one, B², of these grooves, it will be observed, is concentric with the shaft, while the inner one, B¹, is eccentric to both the shaft and the outer groove, although each constitutes a true circle. Arms D, rigidly connected to the shaft at their inner ends, are connected at their outer ends with the buckets or feathering-paddles by means of hinges E, secured centrally upon the back of each bucket near its ends, thus enabling the buckets to rock freely on the hinges. Feathering-pins F, on the opposite edges and ends of the buckets, project into their respective guiding-grooves B¹ B², and move freely therein. The inner groove

is, by preference, made adjustable, so that the dip of the paddle may be varied, if desired. In this instance its axis is above that of the outer groove, but in the same vertical plane. By the employment of two feathering-pins and two guide-grooves at either end of the paddle, steadiness of motion and strength are secured, and the tendency of the paddle to bind or twist avoided.

The operation of the wheel will readily be understood from the foregoing description.

The wheel revolves in the direction of the arrow shown in Fig. 2. The top bucket is always inclined downward and forward at an acute angle, as the two grooves approach each other closely at that point. As the bucket descends, the grooves diverge; the bucket rocks on its hinges, and gradually assumes a position nearly radial to the main shaft, which position it retains while acting on the water, its inner edge gradually gaining on the other as it rises. The buckets are, by my invention, thus caused to enter the water with but little shock, to exert their full force while in the water, and to rise without lifting the water with them.

I do not broadly claim feathering a paddle-wheel, whether by cranks or eccentrics, as that is old; but

What I do claim is—

In a feathering paddle-wheel, the combination of frames, having guide-grooves both eccentric and concentric with the axis of the wheel, and pivoted paddles, having feathering-pins working in said grooves, these members being constructed and operating substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

GEORGE H. SWAN.

Witnesses:

ANDREW BURKE,
W. A. PARROTT.