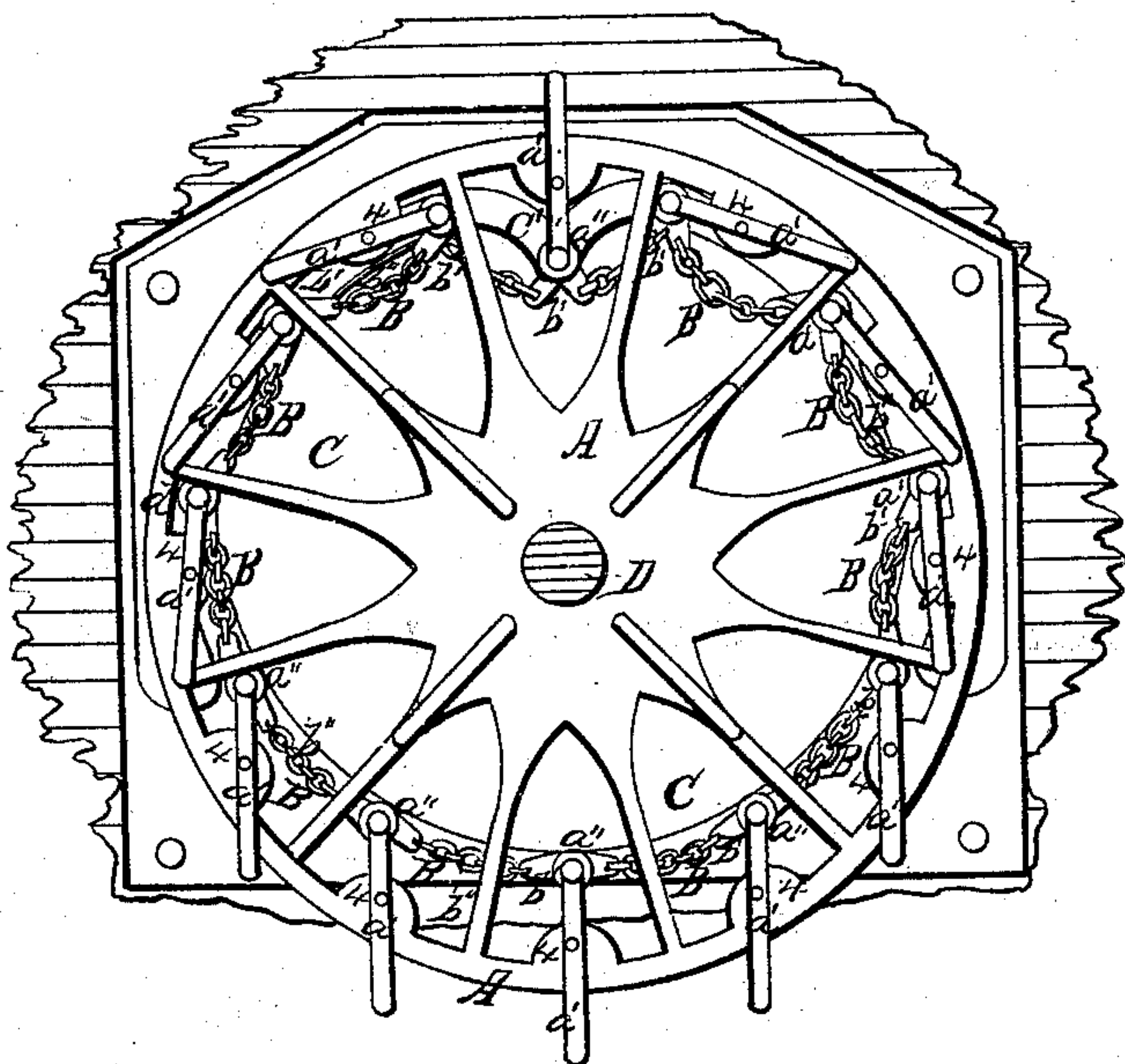


*D. Anderson.*  
*Paddle Wheel.*

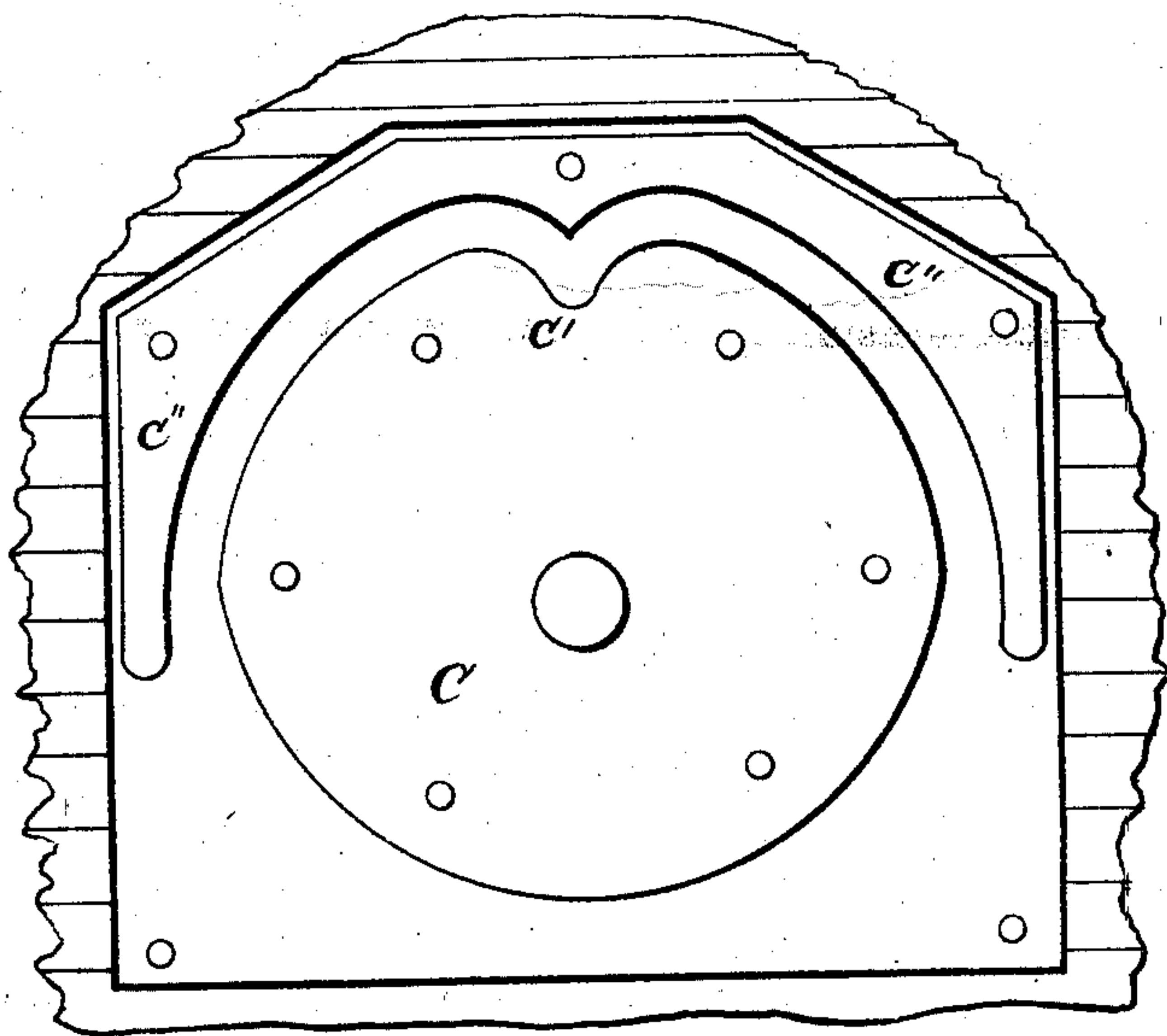
*Nº 99,807.*

*Patented Feb. 15, 1870.*

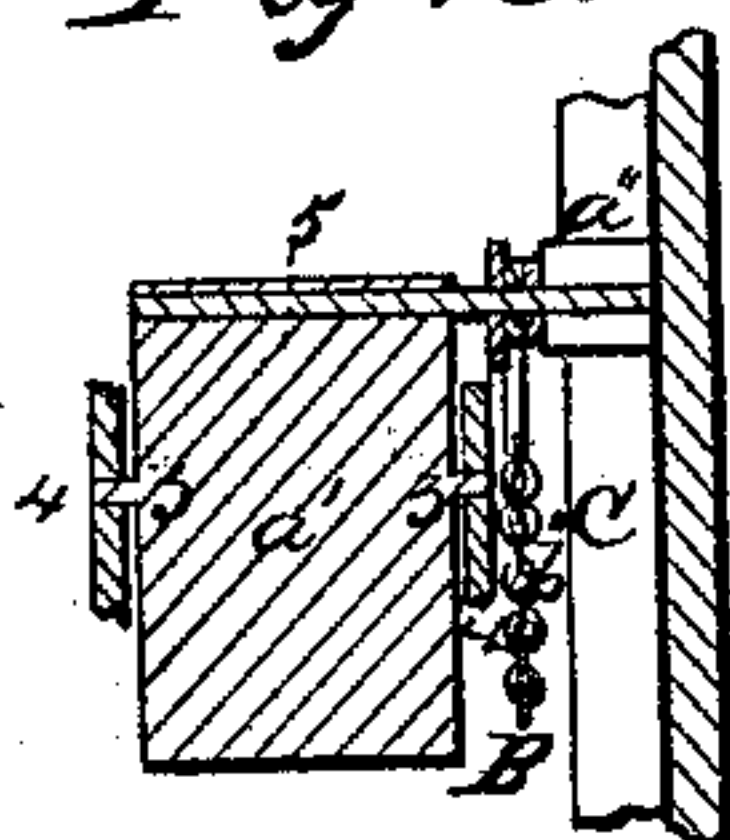
*Fig: 1.*



*Fig: 2.*



*Fig: 3.*



*Witnesses:*  
*Ben. Morrison*  
*Wm. H. Morrison.*

*Inventor.*  
*David Anderson*



# United States Patent Office.

DAVID ANDERSON, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 99,807, dated February 15, 1870.

## IMPROVEMENT IN PADDLE-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

I, DAVID ANDERSON, of the city of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in Paddle-Wheels, of which the following is a specification.

### *Nature and Objects of the Invention.*

My invention relates to that class of paddle-wheels in which the paddles swing on journals and enter, pass through, and leave the water in vertical positions; and

My invention consists in the combination of a coupling-chain between each pair of the paddles, and a friction-roller on an arm of each paddle of the wheel, with a stationary guide-bearing, for the friction-rollers, on the side of the vessel, in such a manner that as the said wheel is being rotated in either direction all the paddles in the lower half of the wheel will simultaneously be kept securely in vertical positions by means of the coupling-chains, friction-rollers, and guide-bearing, the object of my invention being to afford a more simple, inexpensive, and reliable mode of causing the paddles to enter, pass through, and leave the water in vertical positions during the rotary motions of the wheel in either direction

### *Description of the Accompanying Drawings.*

Figure 1 is a side view of a paddle-wheel embodying my invention, the corresponding outside frame of the wheel being removed in order to better represent the invention.

Figure 2 is a front view of a plate showing the stationary guide-bearing for the friction-rollers.

Figure 3 is a detached section showing one of the paddles as suspended upon its two journals, and with its friction-roller bearing against the guide-bearing on the vessel.

### *General Description.*

A is the inner side frame of the wheel;

$a'$   $a'$ , the paddles; and

$a''$   $a''$ , the friction-rollers;

B B, the chains which connect the paddles together; and

C, the guide-bearing on the side of the vessel.

The inner and the outer frames of the wheel are made exactly alike, and are fixed in the usual manner upon the central shaft D, at a proper distance apart to receive between them the paddles  $a'$ , the journals 3 3 of the latter being supported in corresponding bearings, 4 4, in the respective rims of the two side frames of the wheel, at points midway between the spokes of the respective side frames.

These journals, 3, project from the two opposite ends of the paddles  $a'$ , at points which should be about three-fifths of the whole width or depth of the latter, above what may be termed the bottom edge of the

same, so as to give a preponderance to the said lower part of the paddle.

Along near the upper edge of each of the said paddles a straight bar, 5, is fixed, (see fig. 3,) which projects through the spacious opening between the spokes of the inner frame A, sufficiently to afford a journal or arm, 6, for the reception and rotation thereon of the flat eye-links  $b' b'$ , which form respectively the one end of each of two of the chains B B, and of one of the friction-rollers  $a''$ , in such a manner that the said friction-roller will roll along upon the edge of the fixed or stationary guide-bearing C of the plate on the side of the vessel, and also keep the said two eye-links  $b' b'$  of the chains B B between the said roller  $a''$  and the shoulder of the journal 6, so that the chains connecting all the paddles together will, during the rotary motions of the wheel, pass free from contact with either the side frame A or the guide-bearing C. (See fig. 3.)

The guide-bearing C is made nearly in the form of a circular disk, (see fig. 2,) the edge of which is the bearing-plane for the friction-rollers  $a''$ . The upper part of the face, however, is depressed by a short contrary curve,  $c'$ , which serves to turn the paddles, as will hereinafter be described.

The chains B B each consist of the two flat eye-links  $b' b'$ , connected by a series of oval links  $b''$ , and of such a length from eye to eye of the said flat links as will be exactly equal to the distance between the inner end journals 6 of any two proximate paddles  $a'$ . (See fig. 1.)

When the several parts described are properly connected and adjusted, the paddles  $a'$  of the lower half of the wheel will all be in the vertical positions required, as represented in fig. 1, and as the wheel is being rotated, it will be readily understood that, as the friction-rollers  $a''$  simultaneously roll against the guide-bearing C, the paddles of the lower half of the wheel will all be held firmly in the required vertical positions by means of the stretched or straightened connecting chains B B, as they successively enter, pass through, and leave the water, in whatever direction the wheel may be rotating on its shaft D; and that, as the rollers pass upward above the lower half of the wheel, the paddles will gradually be more and more inclined until the rollers reach the depression  $c'$  in the bearing C, and in passing the depression it will cause the paddles to turn over and gradually approach the vertical positions required before reaching the water, as represented in fig. 1.

The projection  $c'$ , over or above the upper edge of the guide-bearing C, is intended to serve mainly as a guard or protector to the friction-rollers  $a''$  against injury or obstruction by anything falling on them from above.

It will be seen that the construction, arrangement,

and co-operation of the different parts of this wheel are comparatively simple, and that the wheel will be easy to construct and keep in order,

It is believed that it will effectively perform the functions attributed to it in a more easy or smooth and steady manner than any other wheel of its class.

*Claim.*

I claim as my invention—

The combination of the coupling chains B B, the saddles *a' a'*, and the friction-rollers *a'' a''* of the wheel with the stationary guide-bearing C on the vessel, substantially as and for the purpose hereinbefore set forth.

DAVID ANDERSON.

Witnesses:

BENJ. MORISON,

W. H. MORISON.