

No. 627,065.

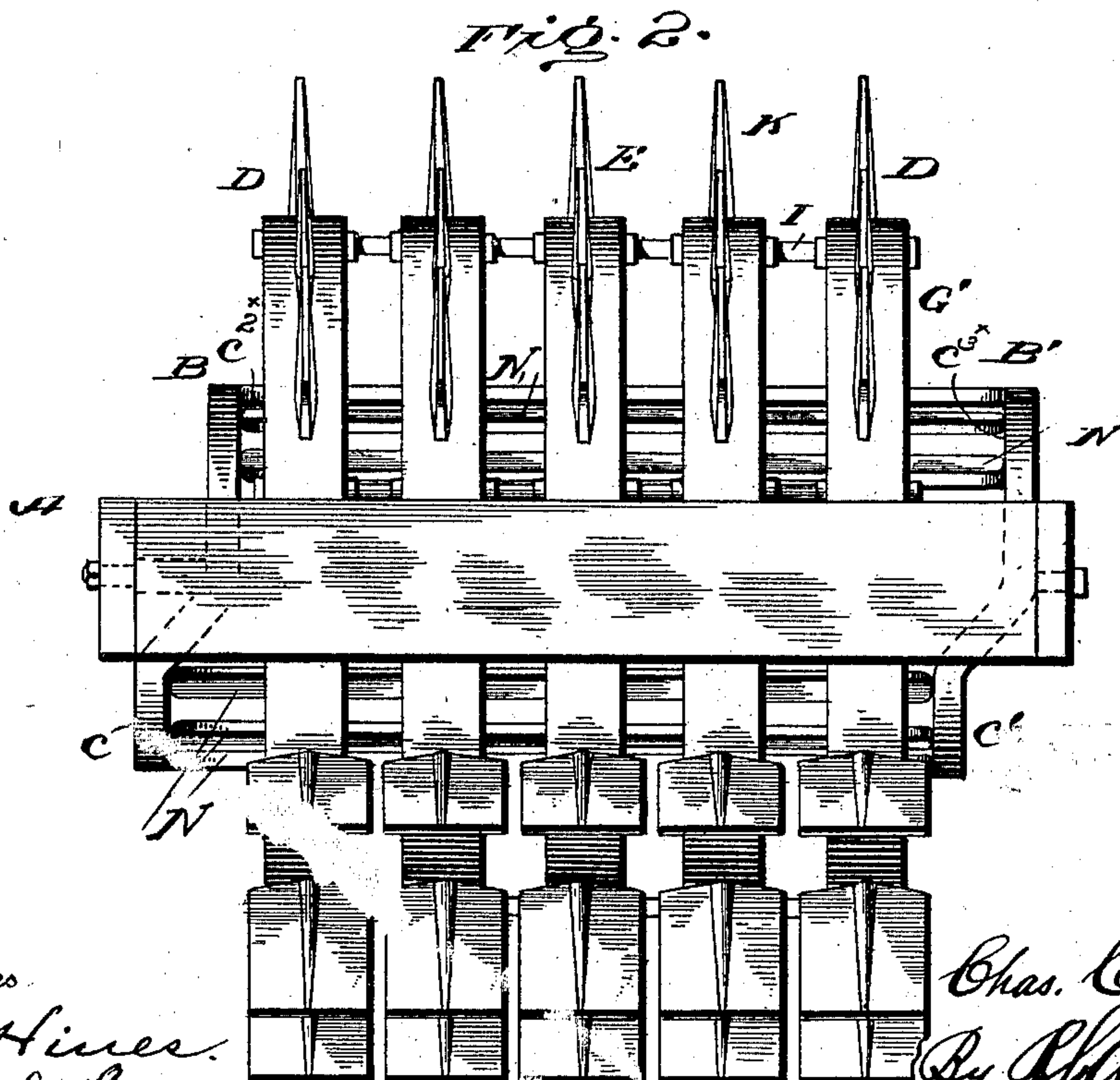
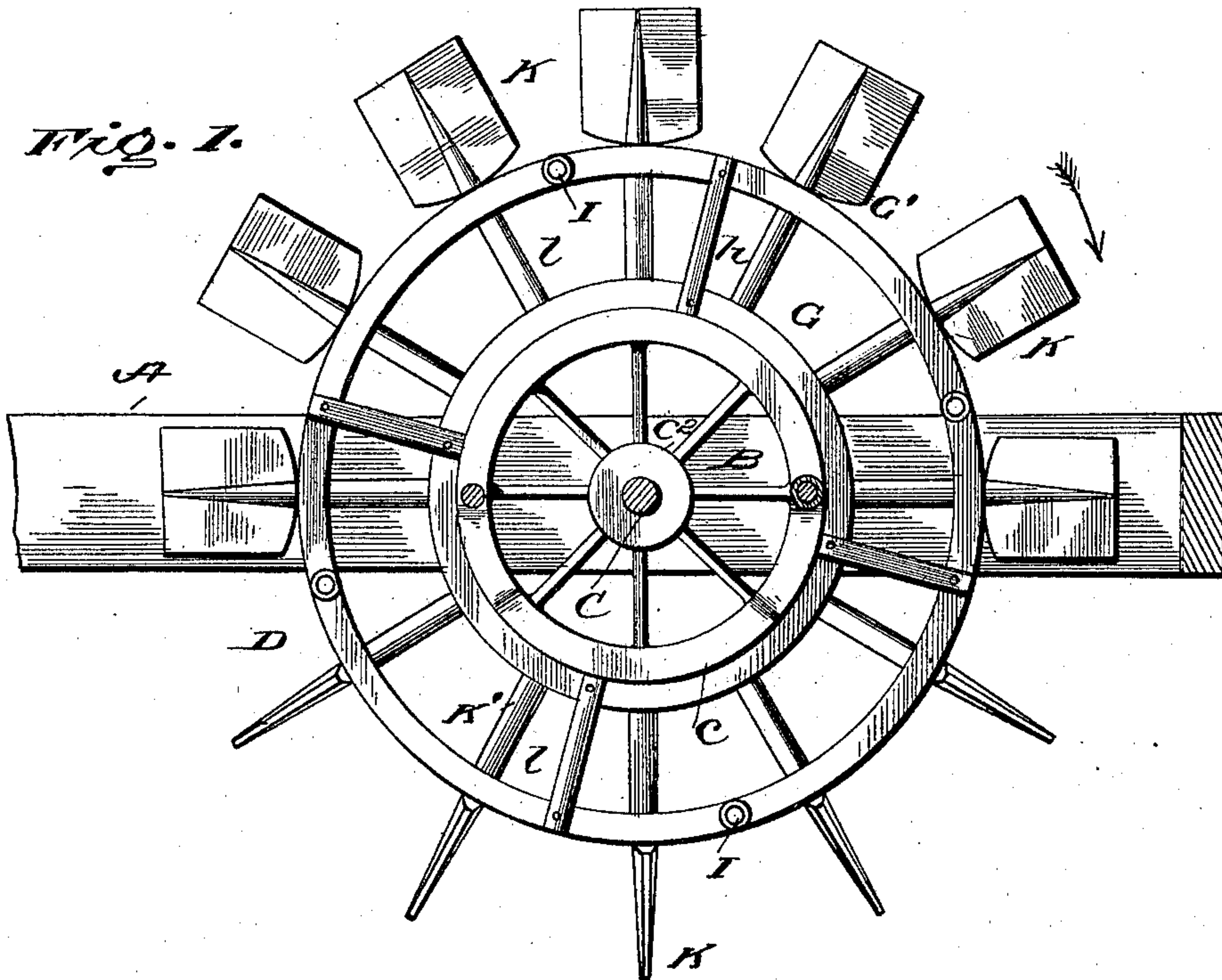
Patented June 13, 1899.

C. C. LEE.
FEATHERING PADDLE WHEEL.

(Application filed June 20, 1898.)

(No Model.)

3 Sheets—Sheet 1.



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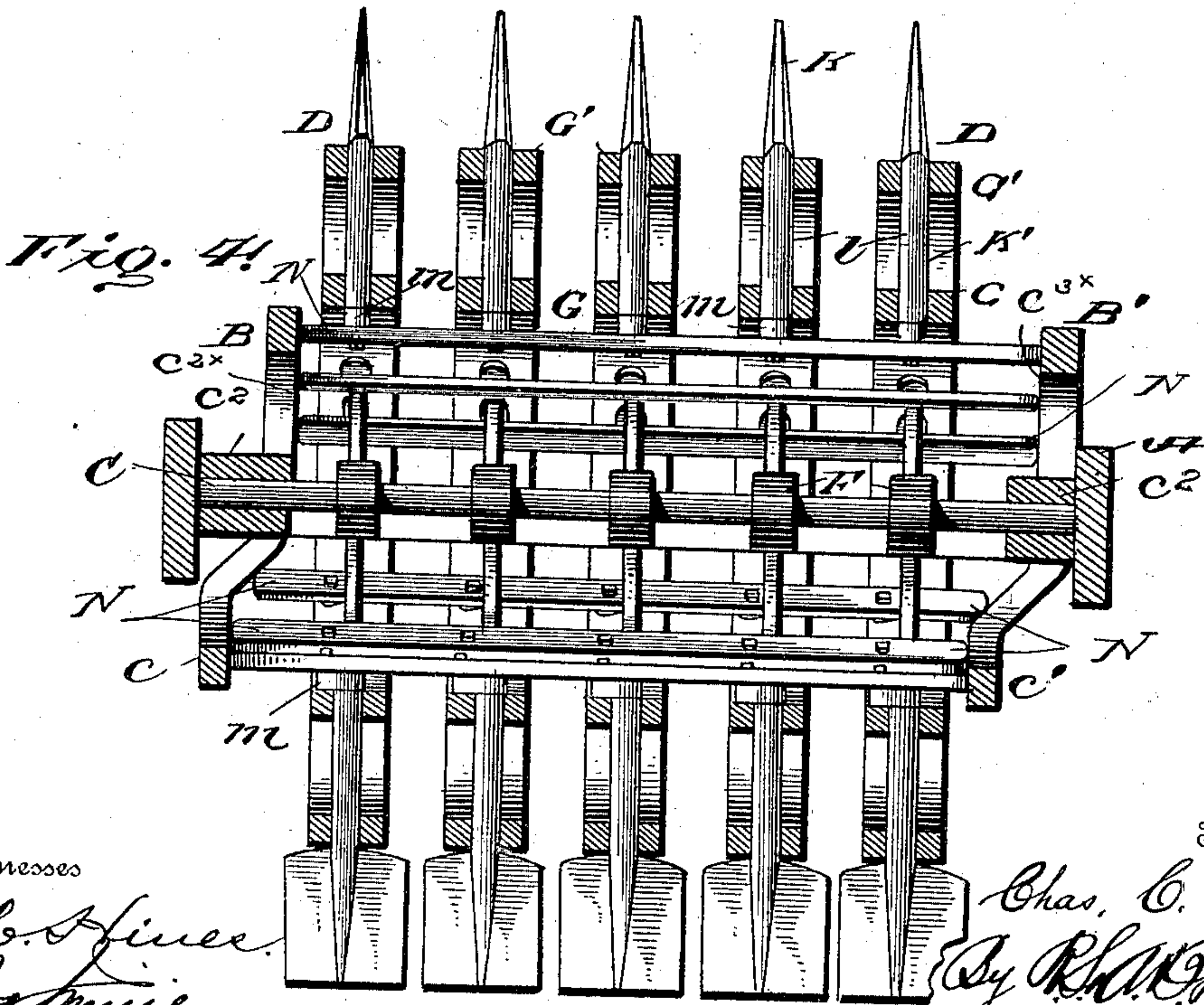
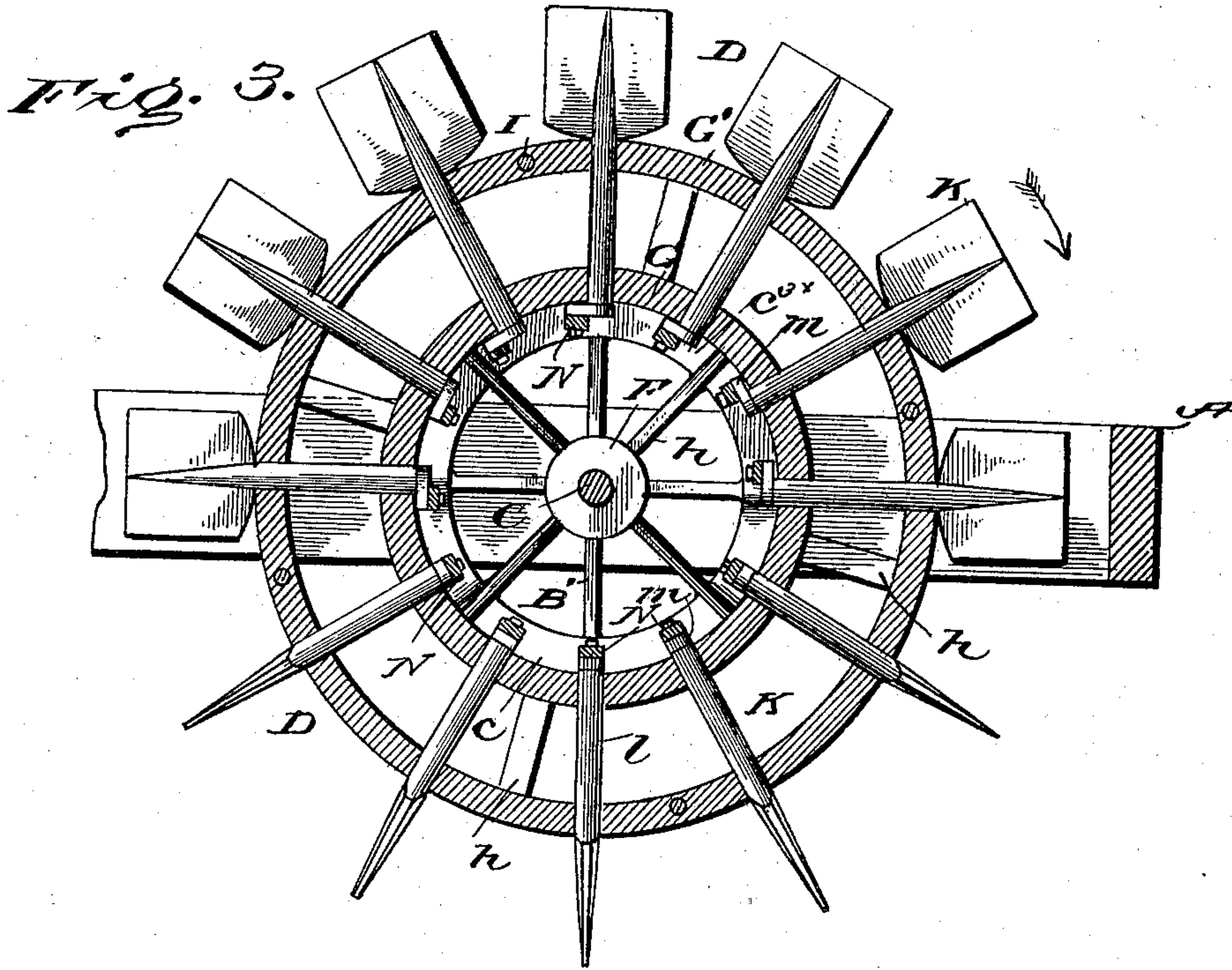
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(No Model.)

3 Sheets—Sheet 2.



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Fig. 5.

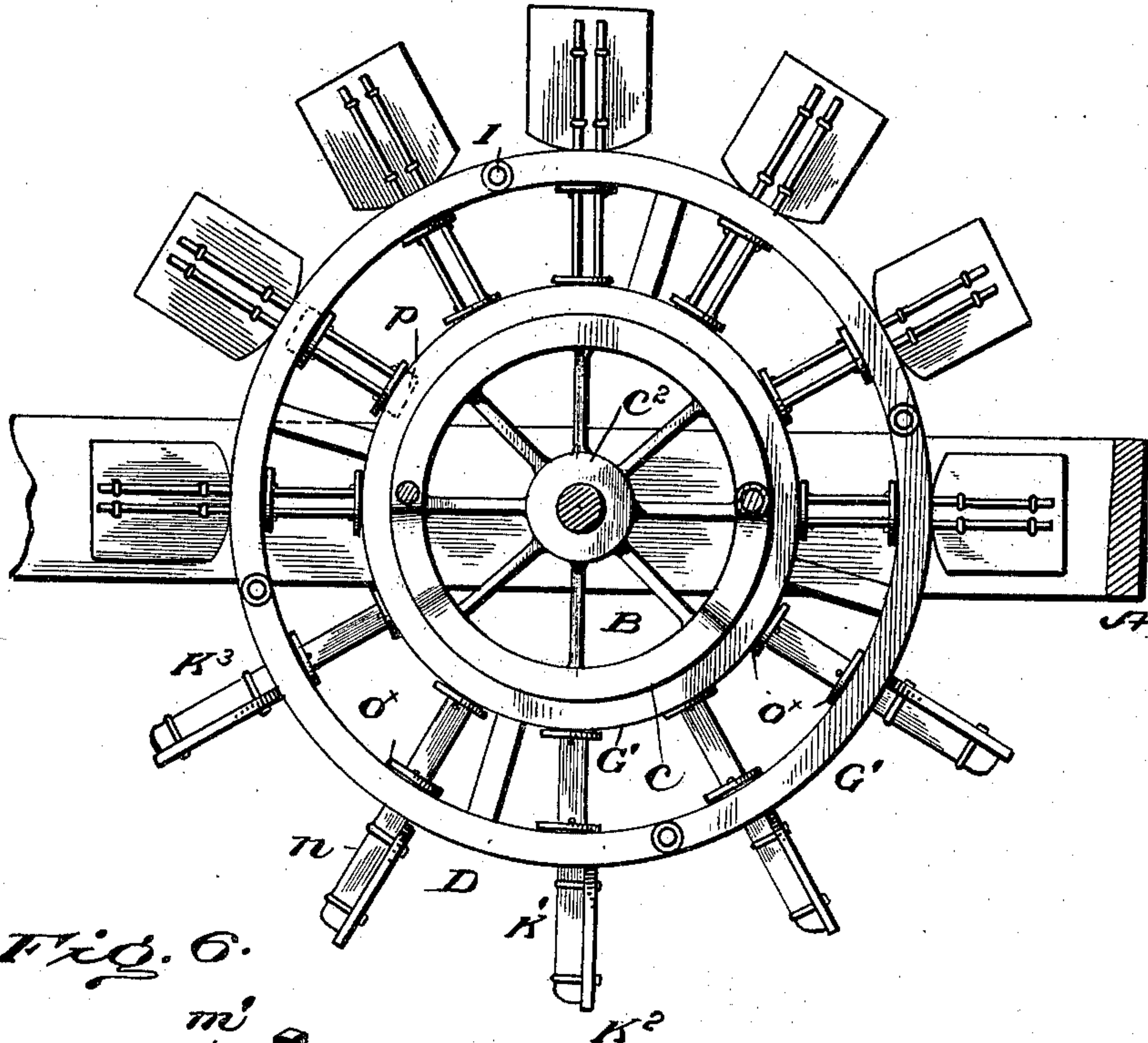


Fig. 6.

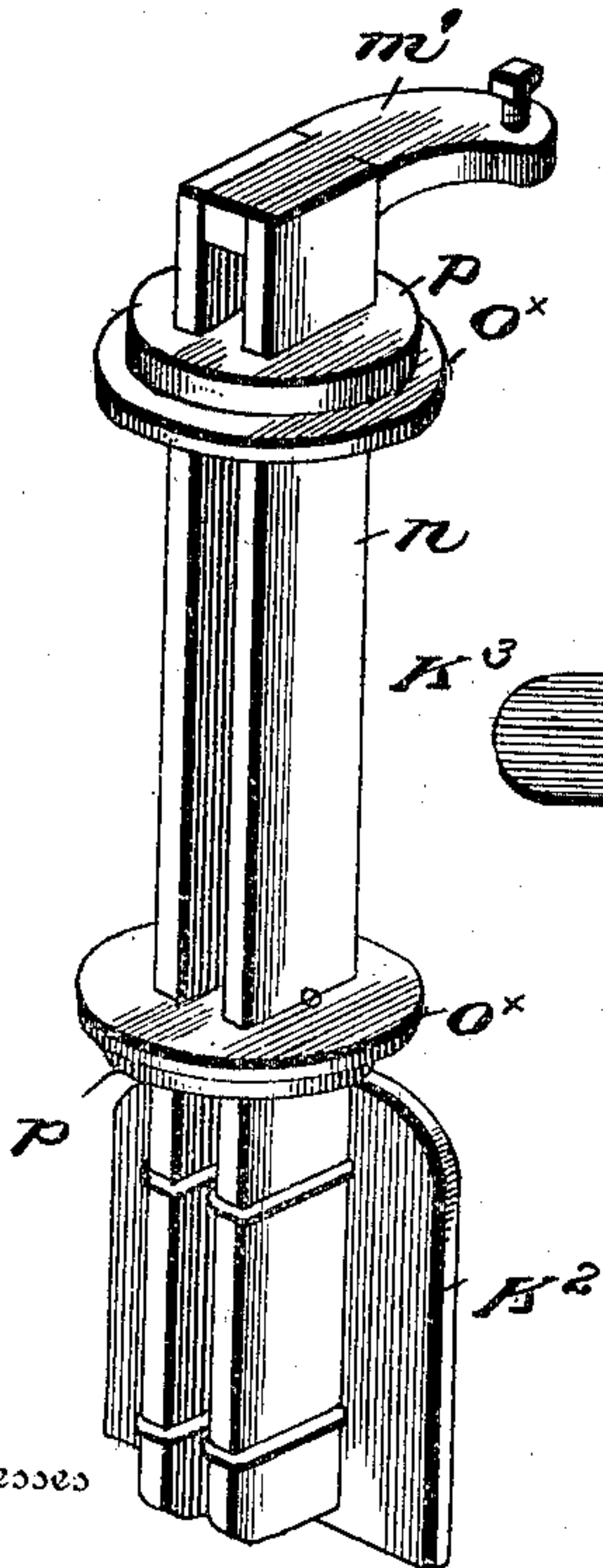
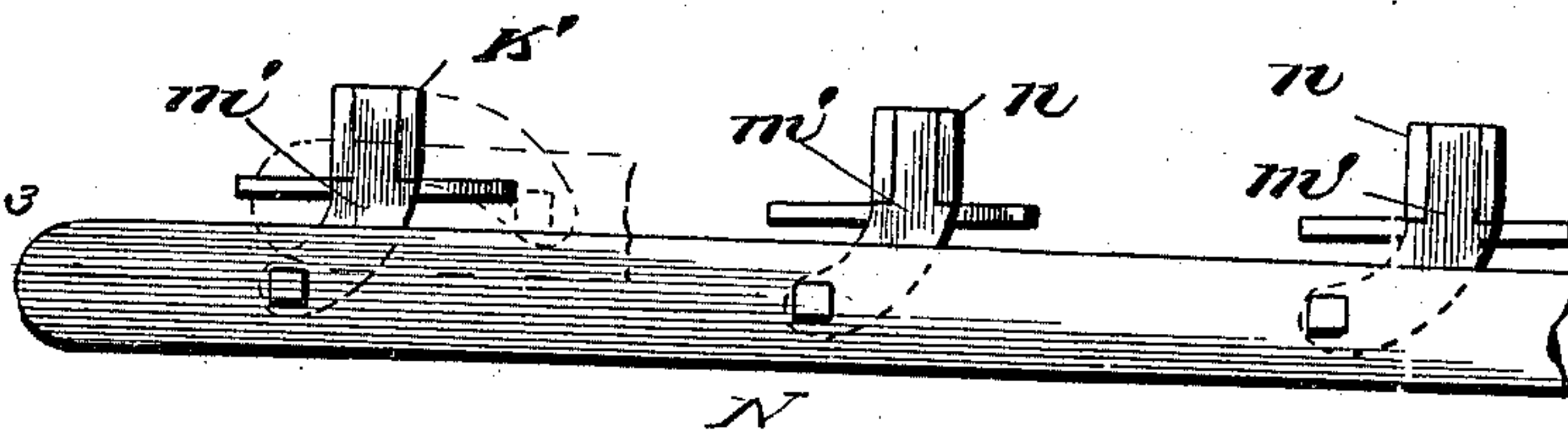


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES CARROLL LEE, OF PADUCAH, KENTUCKY.

FEATHERING PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 627,065, dated June 13, 1899.

Application filed June 20, 1898. Serial No. 683,973. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARROLL LEE, a citizen of the United States, residing at Paducah, in the county of McCracken and State of Kentucky, have invented certain new and useful Improvements in Feathering Paddle-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in feathering paddle-wheels; and it consists, essentially, in the combination, with suitable supports, of a pair of cam-wheels fixed thereto and provided with oppositely-deflected rim portions constituting inclined faces, a power-shaft projecting through the supports and journaled in the hubs of the cams, a series of wheel-like frames arranged side by side and each composed of a hub fixed to said shaft, and inner and outer concentrically-arranged rings connected to each other and to the hubs by spokes or arms, together with an annular series of paddles having staves or spindles journaled in the rings of each wheel and carrying cranks, and transverse shifting bars or rods arranged between the innermost hubs of said frames and having the ends thereof arranged to traverse the cams to feather the paddles during the revolution of the wheel.

The invention further consists in certain novel features of construction, combination, and arrangement of parts, which will be hereinafter more fully described, and particularly pointed out in the appended claim.

The object of the invention is to provide a paddle-wheel of this character which is simple in construction and dispenses with the complicated and cumbersome feathering mechanism commonly employed, which embodies a larger number of paddles proportionately to the size of the wheel, thereby increasing the efficiency of the wheel, and which has the cranks of its paddles and its feathering mechanism inclosed and protected from injury without employing and encumbering the wheel with boxings or casings.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the wheel. Fig. 2 is a front elevation thereof. Fig. 3 is

a vertical longitudinal section. Fig. 4 is a vertical central transverse section. Fig. 5 is a view similar to Fig. 1, showing a modification in the construction of the paddles. Fig. 6 is a perspective view of one of the paddles thereof and its staff or spindle, and Fig. 7 is a detail view of a portion of one of the shifting bars and staff-cranks connected therewith.

Referring now more particularly to the drawings, wherein like letters of reference designate corresponding parts throughout the several views, A designates a suitable supporting-frame consisting of a pair of longitudinal beams, such as are arranged as usual on opposite sides of the wheel housing or casing. Bolted or otherwise rigidly secured to the inner sides of the beam is a pair of wheel-like cams B B', having the felly or rim portions thereof oppositely deflected, as at c c', constituting inclined faces, which are adapted to operate the shifting bars to feather the paddles in the manner hereinafter described. The power-shaft C projects through the beams of the frame and is journaled in the hub portions c² of the cams. To this shaft is secured a series of paddle-frames D, constituting the wheel proper, each of the said frames being composed of a central hub F, keyed or otherwise rigidly secured to the shaft, and inner and outer rings G G', arranged concentrically and connected to each other and to the hubs by a series of spokes or arms h. These frames are arranged side by side, and the outer ring portions of all the frames are securely tied and braced by an annular series of transverse bolts I, having nuts screwed thereon on opposite sides of the ring of each frame, so as to hold the same firmly against lateral play or deflection. In the present instance I have shown the wheel equipped with five paddle-carrying frames of this character; but of course it will be understood that this number may be varied, as desired, according to the size of the wheel and propulsive power to be obtained. Each of said frames carries an annular series of paddles or blades K, which are arranged in alinement in transverse series throughout the several frames, and these paddles are secured to staves or spindles K', projecting through the rings G G' thereof and mounted to oscillate therein.

The inner ends of the paddle staves or spin-

dles project within the space or opening formed between the inner rings and hubs of the frames, as clearly shown in Figs. 3 and 4, and are provided with cranks m , arranged at an angle thereto, so that upon a quarter-turn being given the cranks the latter will impart a quarter-revolution to the paddles or blades to feather the same. The cranks on the several transverse rows or series of paddles are connected to move in unison by transverse shifting bars or rods N , which extend entirely across the wheel in the said space or opening formed between the inner rings and hubs of the frames. The opposite ends of these bars or rods bear against and are adapted to traverse the inner faces of the rim or felly portions of the wheel-like cams to move the cranks and the paddles connected therewith in one direction or the other to cause said blades to present their broad surfaces at right angles to the frames when entering the water and to present their edges to the water when leaving the same to prevent retardation by lifting.

By the peculiar construction and arrangement of the several frames and paddles carried thereby, above described, it will be noted that a larger number of paddles may be proportionately carried by a wheel of given size, thereby materially increasing the power and enhancing the efficiency of the wheel, that the staves of the paddles are braced against lateral deflection or strain by being journaled in the inner and outer rings of the frames, and, further, that the cranks of the paddles and shifting bars or rods are effectually shielded and protected from injury by being inclosed within the space or opening formed between the said inner rings and hubs of the frames without encumbering the wheel with boxings or casings.

In operation as the wheel rotates in the direction of the arrows, Figs. 1 and 3, the opposite ends of the shifting rods or bars traverse the inner sides of the cam-rims and upon encountering the oppositely-inclined faces cc' thereof are moved laterally to the left, as shown in Figs. 2 and 4, thereby acting on the cranks and turning the paddles so that they will extend at right angles to their frames and present their broad sides to the water. As these faces extend approximately around one-third of the circumferences of the cams, the blades will be maintained in such position until they begin to leave the water, whereupon the shifting rods encounter the straight inner faces c^{2x} c^{3x} of the cams, extending around the remaining portions of their circumferences, and are shifted to the right, so as to turn the paddles in a direction longitudinally of the frames, with their edges at right angles to their former positions, as will be

readily understood by reference to Fig. 2 of the drawings.

In the modified construction illustrated in Figs. 5 and 6 the paddles K^2 are connected by U straps or bolts to the staves and each staff comprises in its construction a pair of parallel plates or bars n , between which a tongue on the angularly-arranged crank-arm m' is inserted and secured. Keyed or otherwise secured to said staff and having distance-pieces or cross-bars projecting between the members thereof are a pair of bearing-collars, each composed of a washer-like disk o^x and a bearing-boss p , projecting therefrom. These bosses, as shown in dotted lines in Fig. 5, are fitted in sockets in the wheel-rings G G' and serve as bearings on which the spindle turns. By this construction a strong and durable spindle is provided which is held from longitudinal movement in either direction by the collars.

It will of course be understood that changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having thus fully described the invention, what is claimed as new is—

In a paddle-wheel of the class described, the combination with suitable supports, of a pair of wheel-like cams fixed thereto and provided with oppositely-deflected felly or rim portions forming inclined faces, a power-shaft projecting through the supports and journaled in the hubs of the cams, a series of paddle-frames arranged side by side and connected to each other and each composed of a hub fixed to said shaft and inner and outer concentrically-arranged rings connected to each other and to the hubs by spokes or arms, an annular series of paddles on each of said frames mounted upon staves or spindles projecting through and journaled in the inner and outer rings thereof and provided at their inner ends between the hub and innermost rings with cranks, the several series of blades on the frames being arranged annularly and transversely in alinement, and transverse rods or bars projecting between the inner rings and hubs of the frames and connecting the cranks of the transverse series of paddles, said bars having their opposite ends arranged to traverse the inner faces of the felly or rim portions of the cams and adapted to be shifted thereby to feather the blades, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES CARROLL LEE.

Witnesses:

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R. C. RUDY.