

(No Model.)

A. J. KRAUSSMANN.
ENDLESS CHAIN PROPELLER.

No. 328,123.

Patented Oct. 13, 1885.

Fig. 1.

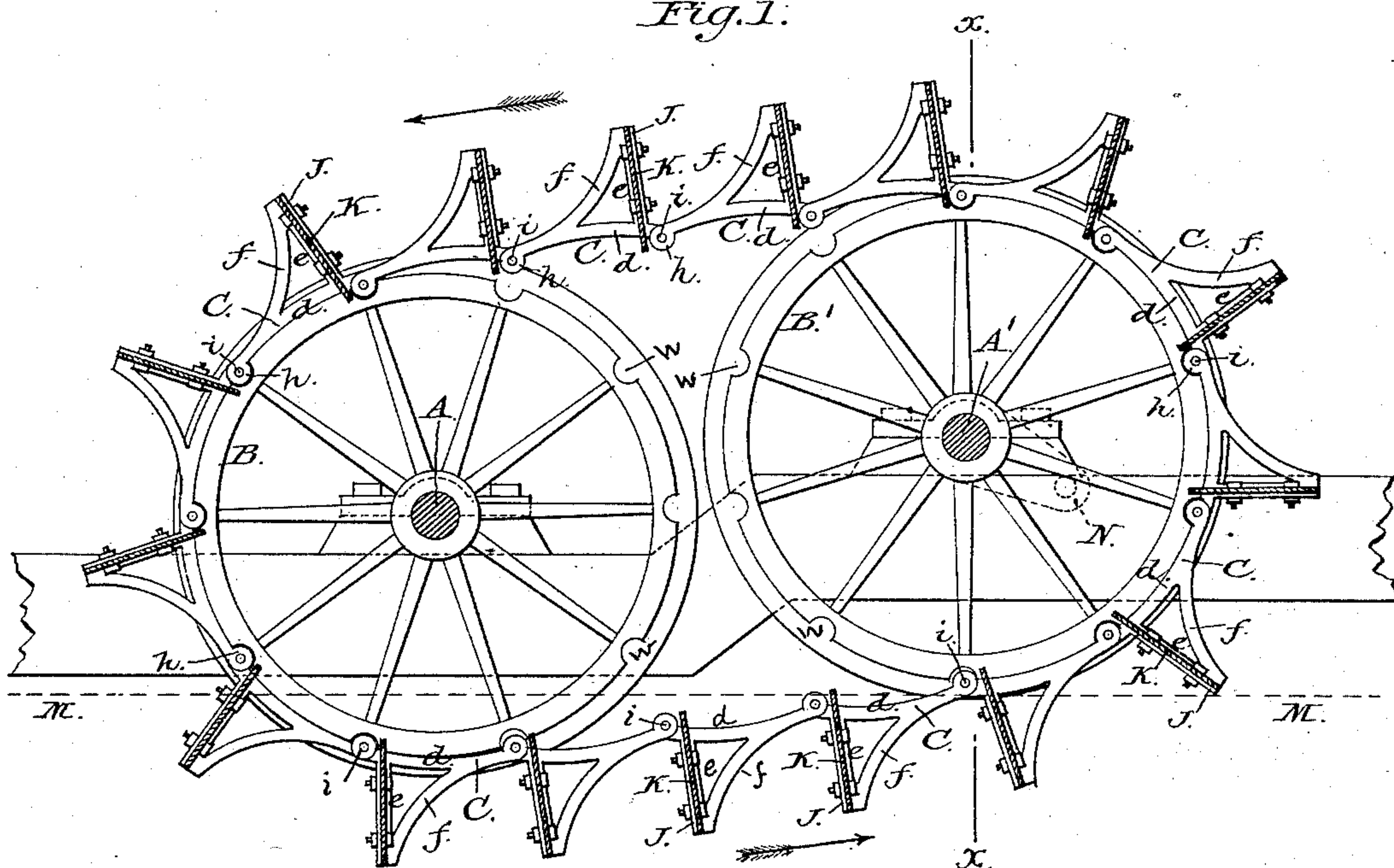


Fig. 2.

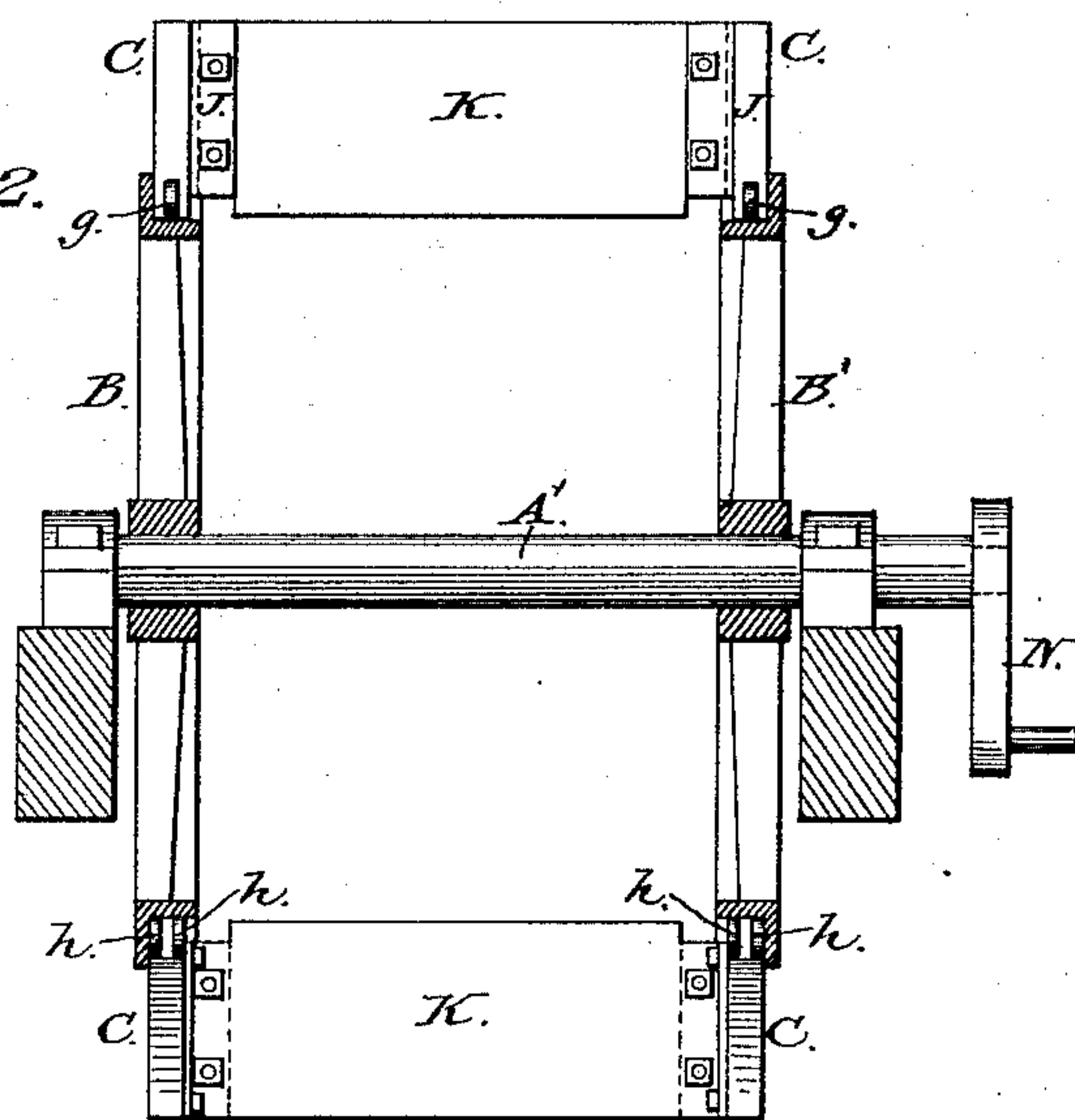
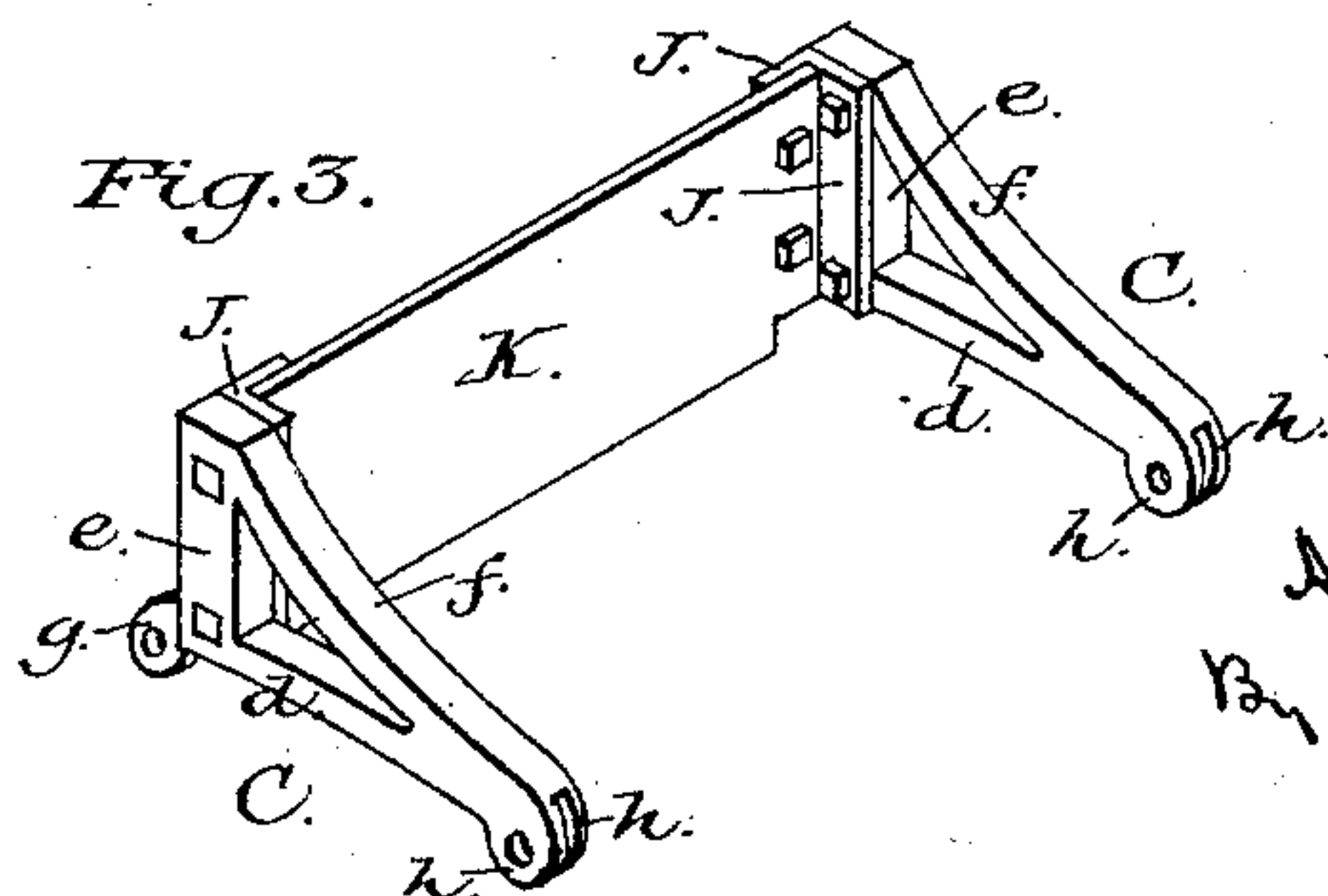


Fig. 3.



Attest:

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UNITED STATES PATENT OFFICE.

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ENDLESS-CHAIN PROPELLER.

SPECIFICATION forming part of Letters Patent No. 328,123, dated October 13, 1885.

Application filed July 18, 1885. Serial No. 171,937. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. KRAUSSMANN, of Astoria, in the county of Kings and State of New York, have invented a new and useful Improvement in Endless-Chain Propellers; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to an improvement in that class of propelling devices or wheels, serving as motors in connection with water, which are constructed of an endless series of paddles or buckets carried around two wheels, so as to move in parallel planes between the wheels.

It consists in an improved construction and combination of the links in the chains or belts carrying the paddles, substantially as hereinafter described.

The object of my invention is to obtain the advantages incident to the effective employment of a large number of paddles without the disadvantages and objections thereto which have hitherto prevented their use in lieu of circular paddle-wheels either for the propulsion of vessels or as undershot water-wheels.

In the accompanying drawings, Figure 1 is a longitudinal central section of my improved endless-chain propeller or water-wheel; Fig. 2, a transverse section in line *xx* of Fig. 1, and Fig. 3 a detached view in perspective of one of the paddles or buckets and its end frames or links.

A A represent two parallel shafts mounted in suitable bearings in the frame of a boat, and B B' B B' wheels of uniform diameter fixed in pairs upon each shaft, the distance between the wheels in each pair being equal to the length of the paddles to be mounted thereon.

C C C are links pivoted together to form two endless chains, which are carried over the peripheries of the corresponding wheels B and B' on each shaft. Each link is constructed in the form of a frame or bracket having two arms, *d* and *e*, fixed at a right angle to each other, and which may be strengthened by a diagonal brace, *f*, extending from the end of one arm to the end of the other,

as clearly illustrated in Fig. 3. The longer horizontal arm *d* of the link is of a length equal to the distance which is required between the paddles to be mounted on the chain. Its ends terminate, the one in a tongue, *g*, and the other in two jaws, *h h*, (see Fig. 3,) between which the tongue of the next link will fit, so as to form a knuckle-joint, and the links are hinged together to form a chain by fitting the tongue of the one between the jaws of the other and pivoting them by a transverse pin, *i*, passing through the jaws and tongue, and upon which the tongue turns freely. The tongue and jaws constituting the knuckle-joint are circular in form, and are made to project below the lower face of the horizontal arm *d*, as shown in the drawings, to fit into counterpart recesses *w w*, formed in the peripheries of each wheel B B', the recesses being formed at regular intervals apart corresponding to the distance between the pivots in the joints of each link. To the inner face of the shorter upright arm *e* of each link an angle iron, J, is bolted, so that one of its flanges shall project inward and provide a flat surface against which the end of a paddle or float, K, may be fitted and secured.

Each chain is composed of the same number of links, all of equal length.

The paddles K K, consisting, preferably, of flat boards or plates, being secured at each end, in manner as described, to the opposite links in the two chains, as shown in Fig. 3, thereby form an endless chain of paddles with but a single connecting-link between any two paddles; hence there are no intermediate joints in the chains between the paddles, and each paddle is thereby kept firmly throughout its entire movement in position at a right angle to the longer arms of the link which carries it. By causing the knuckle-joint forming the hinges of the links to engage recesses in the peripheries of the wheels the chains are kept uniformly taut and prevented from slipping upon the wheels, thus obviating all lost motion.

The rear shaft, A', is fitted with a crank, N, or otherwise geared directly to the motive power, to constitute the driving-shaft of the propeller, and the two shafts are so mounted as that the wheels and paddles shall overhang the water at a height which will permit the paddles

to enter the water as they pass from one wheel to the other on the lower side thereof. The rear shaft, A', is, moreover, mounted in bearings at a level so far above the level of the bearings of the front shaft, A, as that the paddles carried in endless chain over the wheels on the two shafts shall in entering the water under the front shaft pass fully beneath its surface, preferably to a depth about one-half that of their width, while under the rear shaft the paddles shall barely be immersed, as is illustrated in Fig. 1, wherein M M represent the water line or level. This inclination of the line of movement of the paddles to the surface of the water, whereby the paddles are at first deeply submerged, but are gradually brought nearer to the surface as they move back, not only greatly facilitates their movement, but increases greatly their effective working-power, first, by presenting in the aggregate a wider effective surface to the water between the front and rear wheels than if the paddles followed each other on the same level, and, second, by bringing the paddles to the surface before they are taken up out of the water, whereby their tendency to lift and carry up with them a volume of water is so far diminished as to become in practice scarcely appreciable as a resisting force.

It is evident that by mounting the paddles to dip in a sluice or race way, of which M M, Fig. 1, may, for the purpose of illustration, be considered as the upper edge, and through which a stream of water is made to flow with force, the paddles and wheel may become a source of motive power for mill machinery or other purposes, the force of the water brought to bear against the surfaces of the paddles operating to move them in like manner as are the paddles of an undershot water-wheel,

the inclination in the line of movement of the paddles, whereby a different degree of submersion is obtained at one end than at the other of the chain, operating efficiently in manner as above described to increase the total effective surface exposed to the force of the water.

I do not herein claim as new the superior elevation of one end of the endless propelling-chain, as described; but

I claim as my invention—

1. In a propeller, parallel endless chains formed of rectangular links, each constructed with two arms fixed at a right angle to each other, one arm of each link being hinged directly to the angle of the next, and the free arms of the corresponding parallel links in the two chains connected by transverse paddles, substantially in the manner and for the purpose herein set forth.

2. An endless-chain propeller constructed of two chains of rectangular links, each link constructed of two arms fixed at a right angle to each other, and each pivoted at its angle or elbow directly to the end of one arm of the next link by means of a projecting knuckle-joint adapted to engage a counterpart recess in the rims of the wheels over which the chain is carried, the projecting free arms of the corresponding links in the two chains being connected by transverse paddles, all substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW J. KRAUSSMANN.

Witnesses:

J. F. ACKER, Jr.,
A. B. MOORE.