(Model.)

A. H. CARPENTER.

FEATHERING PADDLE WHEEL.

No. 381,674. Patented Apr. 24, 1888.

Fig. 1.

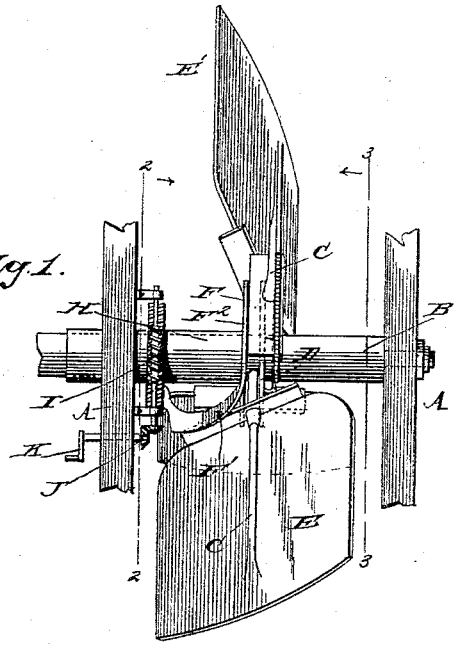


Fig. 2.

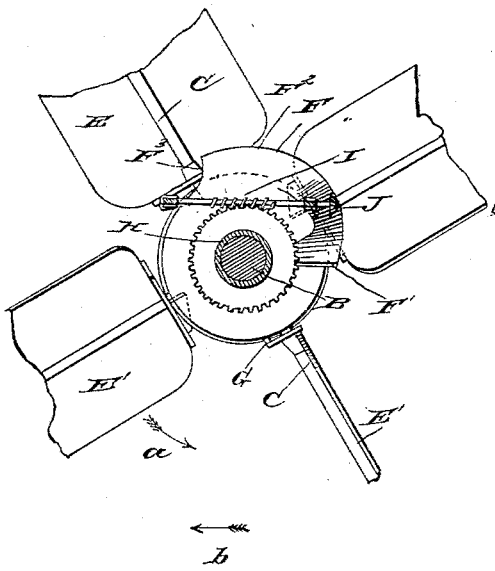
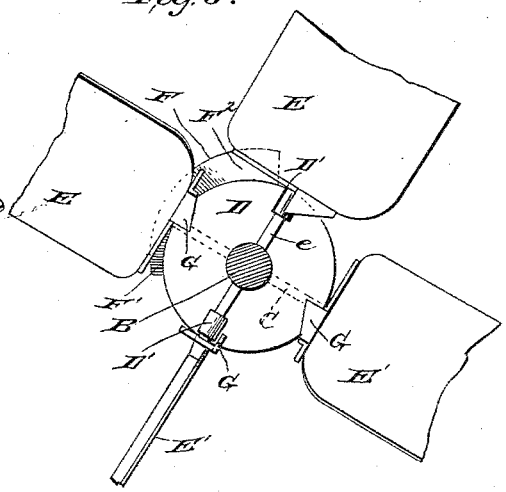


Fig. 3.



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AMOS H. CARPENTER, OF WEST WATERFORD, VERMONT.

FEATHERING-PADDLE WHEEL.

SPECIFICATION forming part of Letters Patent No. 381,674, dated April 24, 1888.

Application filed June 6, 1887. Serial No. 240,453. (Model.)

To all whom it may concern:

Be it known that I, AMOS H. CARPENTER, of West Waterford, in the county of Caledonia and State of Vermont, have invented certain new and useful Improvements in Feathering-Blade Wheels, of which the following is a full, clear, and exact description.

My invention relates to improvements in feathering-blade wheels in which transverse rock-shafts on the main shaft each carry counter-blades which are thrown alternately into and out of action by cams operating the blades in their rotation.

The object of my improvements is to render wheels of this character peculiarly adaptable as propellers.

I will first describe in detail a feathering-blade wheel embodying my improvements, and then point out the nature of the improvements in claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference designate corresponding parts in all the figures.

Figure 1 is a plan view of a wheel with feathering-blades embodying my improvements. Fig. 2 is a sectional side view of the said wheel on the line 2 2, Fig. 1. Fig. 3 is a sectional side view of the same on the line 3 3, Fig. 1.

A designates bearings, and B a main shaft journaled therein, which, in the case of a propeller, could be arranged transversely to a vessel at a distance below the water-line sufficient to totally submerge the wheel.

The transverse rock-shafts C, of which I have shown two arranged at right angles with each other, are mounted in the main shaft nearly in contact with each other, a rotary disk-like frame, D, only being interposed therebetween to form bearings D′ for the rock-shafts at a distance from the main shaft, and thus stiffen the rock-shafts.

The counter-blades E E′ on the several rock-shafts thus revolve nearly in the same plane, and the inner corners of all the blades when facing in the direction of rotation are adapted to come successively in contact with the curved approach F′ of one and the same camway F, and be thereby thrown edgewise, as most clearly shown in Fig. 1. As each blade E is thrown edgewise its counter-blade E′ is faced, so that the blades at the bottom of the wheel being in action while those at the top are out of action, as shown in the drawings, the rotation of the wheel by gearing connected with the main shaft B in the direction of the arrow *a*, Fig. 2, will in the case of a propeller cause the vessel to which it is attached to move in the direction of the arrow *b*, Fig. 2.

To better enable the inner ends of the blades E and E′ to withstand the shocks of contact with the camway-approach F′, I may extend them laterally to form transverse stiffening-ribs, as shown.

The approach F′ of the camway terminates in a segmental guideway, F^2, arranged in the plane of rotation of the blades, whereby the latter are held in their edgewise position after being thrown thereinto by the approach F′.

The curved shoulder F^3 at the terminus of the guideway F^2 is arranged to release each blade and allow it to be faced by the action of the approach F′ upon its counter-blade.

Each blade is provided on its inner end with a central stop-shoulder, G, projecting inward over the edge of the disk-like frame D, and adapted to strike the side of the frame D when the blade is faced, and thereby limit the swing of the blade, as most clearly shown in Fig. 3.

In order that the camway F may be adjusted so as to regulate the point at which the blades will be thrown in and out of action, I fix it upon a sleeve, H, mounted to turn upon the main shaft. As one method of turning said sleeve and locking it in position when adjusted I have represented a worm-gear, I, connected by a bevel-gear, J, with a crank-handle, K, which in a propeller should be arranged in a water-tight compartment of the vessel. Thus by simply turning the crank-handle K the camway may be adjusted to throw the blades out of action at the top of the wheel, and in action at the bottom thereof, as shown, to propel the vessel in one direction, or to throw the blades in action at the top of the wheel and out of action at the bottom to propel the vessel in the opposite direction, all without reversing the motion of the propeller.

In lieu of the camway-shoulder F^3, which releases the blades abruptly, I may employ a curved retreat similar to the approach F′, for releasing the blades gradually.

Having thus described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the main shaft B, having a fixed frame, D, of the rock-shafts extending through said main shaft, having bearings also in the said frame, and provided with blades at their opposite ends at right angles to each other, the sleeve loose on the main shaft and having a cam-track, F, projecting beyond the periphery of the frame D, provided with a curved approach, F′, to engage the inner end of the blade, and a straight portion, F^2, against which the blade is held flatwise, and gearing for operating the said sleeve, substantially as set forth.

2. The combination, with the main shaft having a fixed frame, D, of the rock-shafts extending through the said shaft, having bearings also in said frame and provided with blades at right angles to each other, the stops G on the inner ends of the blades and engaging the outer face of the said frame, the rotary sleeve H, loose upon the main shaft, and having operating-gearing at its outer end and a cam-track, F, on its inner end projecting beyond the frame D, having a straight portion, F^2, to engage the faces of the blades at their inner ends, and the curved approach F in the path of the inner ends of the advancing blades, substantially as set forth.

3. In a propeller, the blade E, having the rib E^2 along its inner end at the front face thereof, and the stop G, projecting below the inner edge of the blade from the opposite or rear face thereof, substantially as set forth.

4. The combination, with the main shaft, and the rock-shaft extending therethrough and having blades at right angles to each other at their ends, of the rotary sleeve H, loose on the shaft, the cam-track F F′ F^2 at the inner end thereof to engage and guide the inner ends of the blades, the gear on the sleeve, and the worm-shaft for operating and locking said gear and sleeve, substantially as set forth.

AMOS H. CARPENTER.

Witnesses:

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