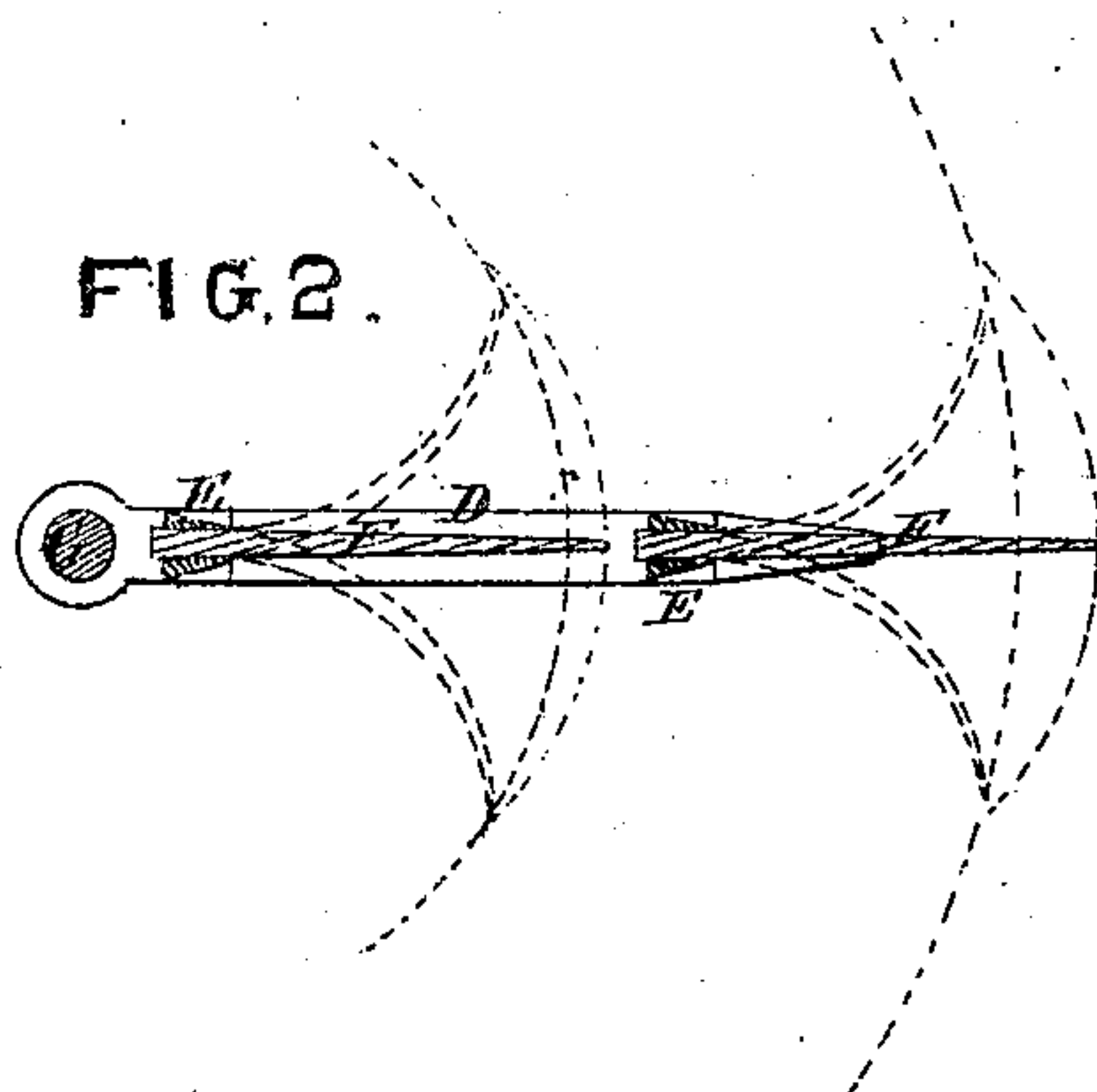
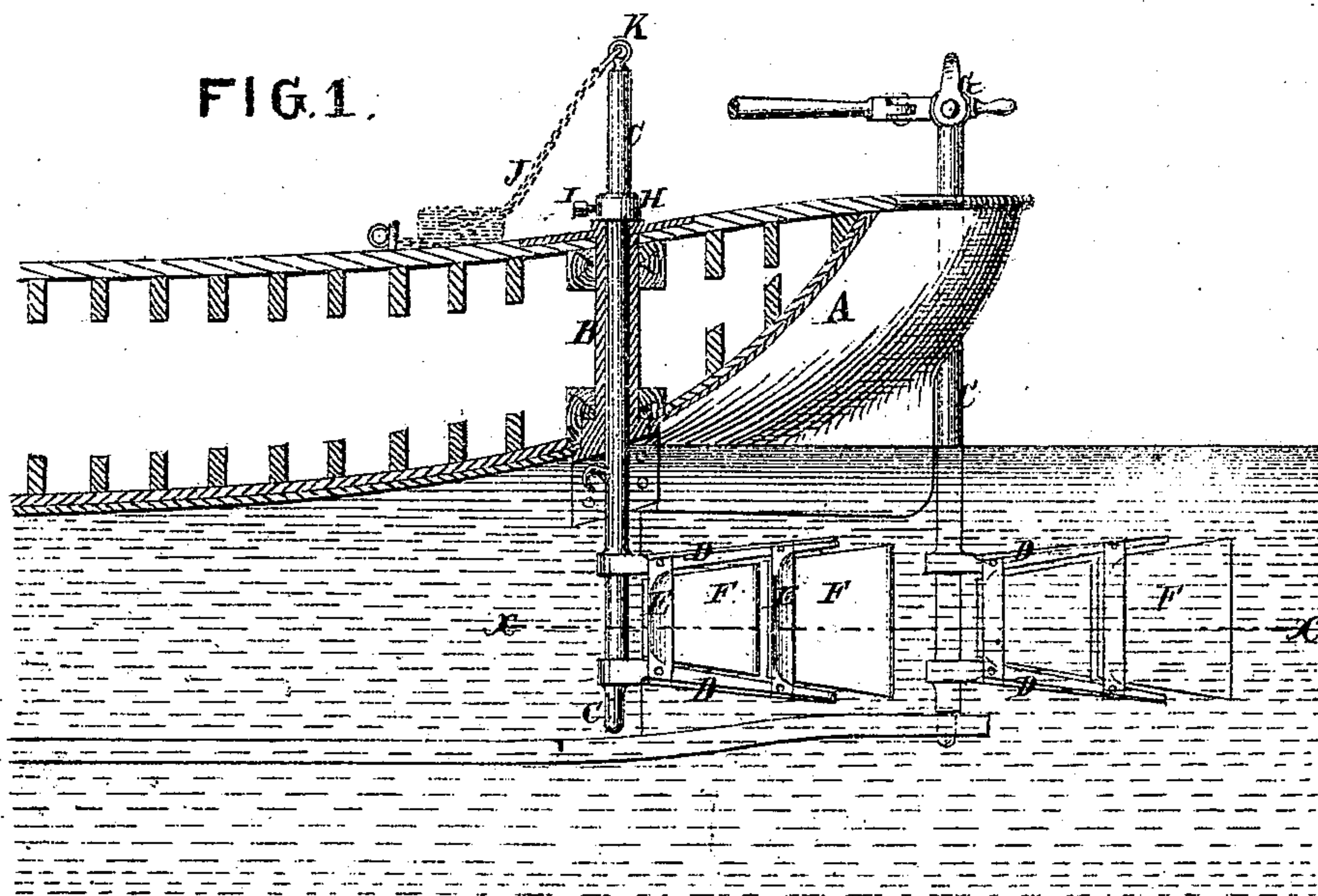


R. Hunter,

Vib. Propeller.

No. 107,376.

Patented Sept. 13. 1870.



Witnesses:

Geo. L. Ewin

Edward Knight

R. Hunter M. D.
By Knight Bros
Attorneys

United States Patent Office.

ROBERT HUNTER, OF NEW YORK, N. Y.

Letters Patent No. 107,376, dated September 13, 1870.

IMPROVEMENT IN PROPELLERS.

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

I, ROBERT HUNTER, of the city of New York, doctor of medicine, have invented a new and useful Improvement in Propellers, of which the following is a specification.

Nature and Objects of the Invention.

My invention relates chiefly to a class of reciprocating propellers, adapted, by their construction, to act in a manner similar to the tail of a fish, and consists in constructing such propellers with solid blades of India rubber, tapering in thickness, and clamped by their thick edges between metallic bars in a vibrating frame, as hereinafter described.

Description of the Accompanying Drawing.

Figure 1 is a vertical longitudinal section of a portion of the stern of a vessel, with my invention applied.

Figure 2 represents a horizontal section of the propeller at $x x$, fig. 1.

General Description.

A represents a part of a vessel's hull within which, at or near the stern, or at the bow, or in any other place where it may be desired to apply the propeller, is a vertical casing or well, B, open to the water at bottom and to the air at top. The said casing extends upward well above the water-line, and, preferably, up to the deck, so that, though the water rises freely within the casing, it cannot thereby enter the vessel.

C is a shaft, so mounted as to turn or oscillate freely within the casing B.

Upon the lower part of this shaft is mounted the propeller-frame, made preferably of iron or steel, and consisting of two or more flat bars, D D, projecting horizontally or at right angles to the shaft C, and a number of bars, E, arranged in pairs, parallel with the shaft C, and connecting the bars D.

The two bars E of each pair are set at the necessary distance asunder to serve as a socket for the reception of the propelling-blades F, each of which is made of wedge shape, of India rubber, and bolted by its thick edge between the two bars E.

The more flexible thin edge of the blade projects backward, so that, as the shaft is vibrated, the blades will, by the resistance of the water, assume an oblique position on one side or the other, as indicated by dotted lines in fig. 2, and, by the obliquity of the surfaces thus presented, exert a powerful propelling force under the vibration of the propeller.

The bars E are preferably tapered in thickness,

backward or toward the flexible blades, as shown in fig. 2.

The vibratory movement may be imparted to the shaft C through the medium of an arm, G, within or in relation to which the shaft may be reversed, so as to present the propeller in either direction, and thus propel the vessel either forward or backward. The arm G is to be actuated by a pitman or connecting-rod from a crank or reciprocating engine.

The shaft C is supported by a collar, H, secured by set-screws I, or equivalent means, and removable when required, so that the shaft may be passed downward through the casing B, and suspended by a chain, J, attached to an eye-bolt, K, a second chain or line, either permanently attached or provided with a hook or suitable grapple, being employed to take the propeller in board. It may thus be unshipped for examination, repair, or other purposes, with great convenience while the vessel is afloat, and afterward replaced by passing it over the side and drawing it up into its place, with equal facility.

A propeller of the construction described may be arranged on a horizontal shaft, if preferred.

I am aware that propellers have been made with tapering steel blades. This, therefore, I do not claim.

My solid rubber blades, used in the manner described, possess several important advantages. They weigh nothing in water, are not subject to corrosion, and, by having much greater thickness at the base than is practicable in steel blades, they are found to assume, under the resistance of the water, a better form for propulsion.

The compressibility of the material is also of great practical value in this connection, adapting it to be clamped firmly between the metallic bars, without the drilling that is necessary with steel blades. The metallic bars being clamped upon the rubber, become imbedded in it, so as to hold it with perfect security, and in this way a defective blade may be removed, and a new one inserted, at any time, by the boat's crew, without the aid of a skilled mechanic.

Claim:

I claim as my invention—

The propeller herein described, consisting of blades of India rubber, tapering in thickness, bolted between metallic bars or plates, attached to a shaft, substantially as herein described.

R. HUNTER.

Witnesses:

W. M. AMPH,
OCTAVIUS KNIGHT.