

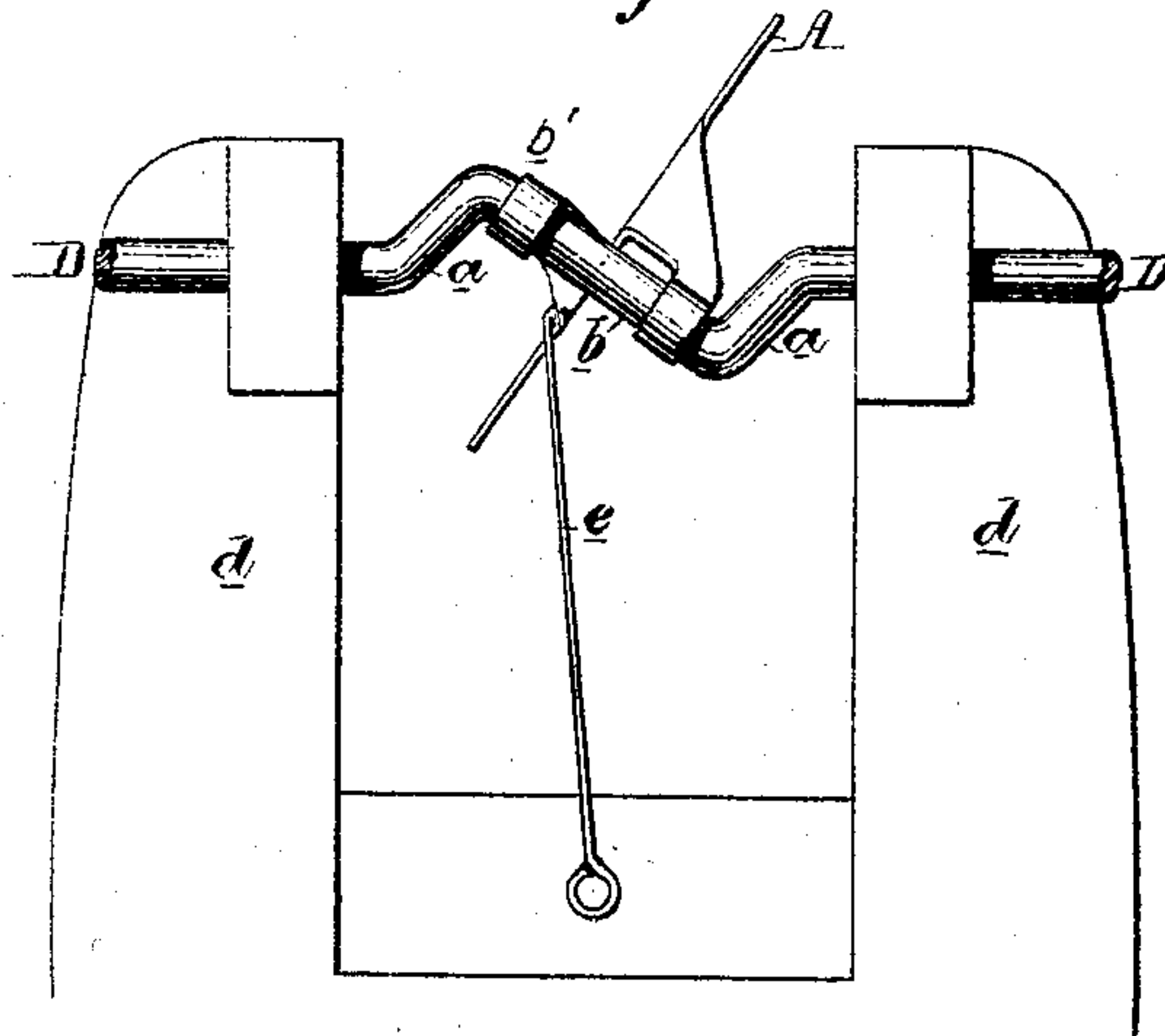
D. BAINBRIDGE.

Vibrating Propellers for Vessels.

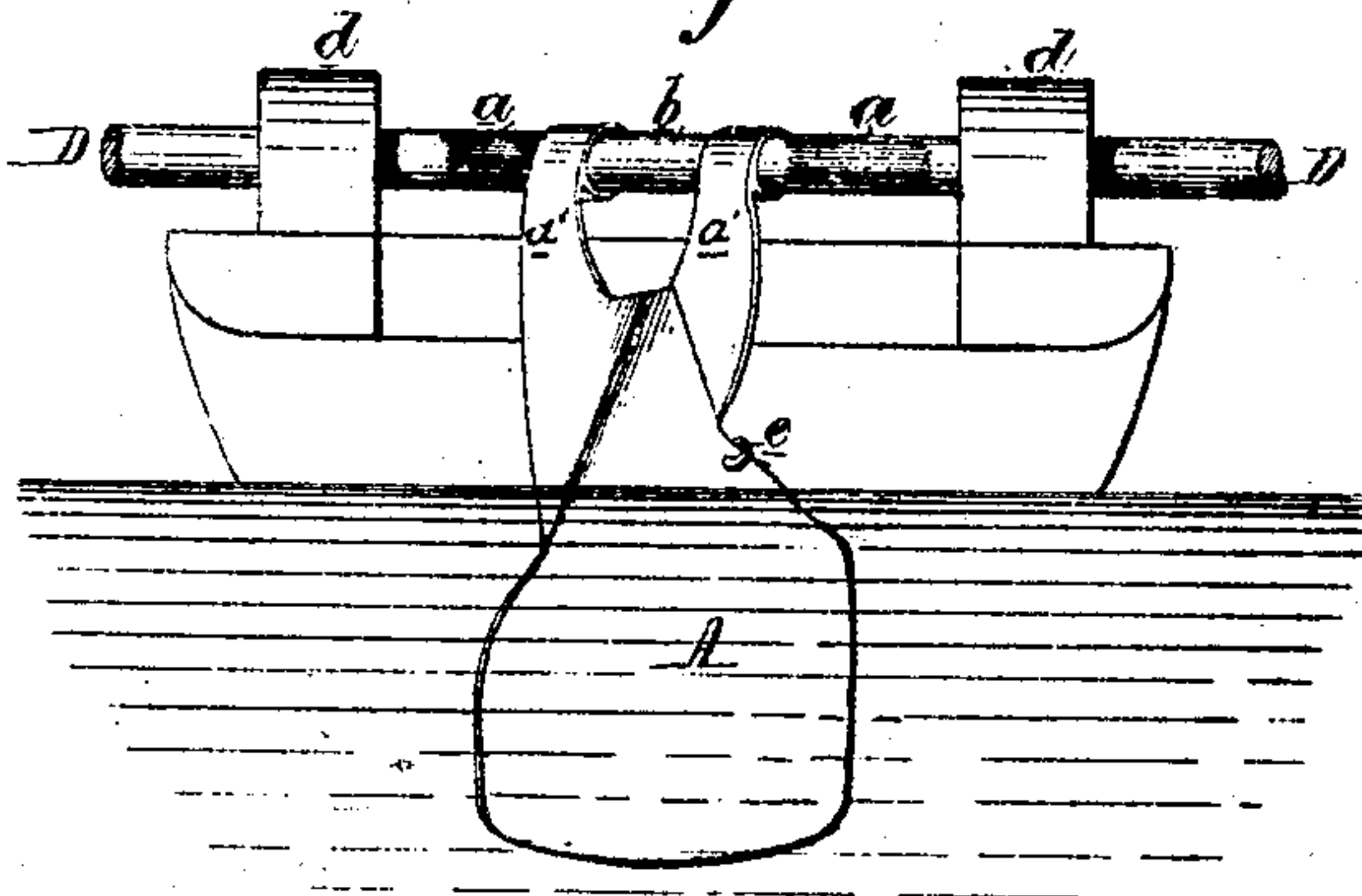
No. 135,257.

Patented Jan. 28, 1873.

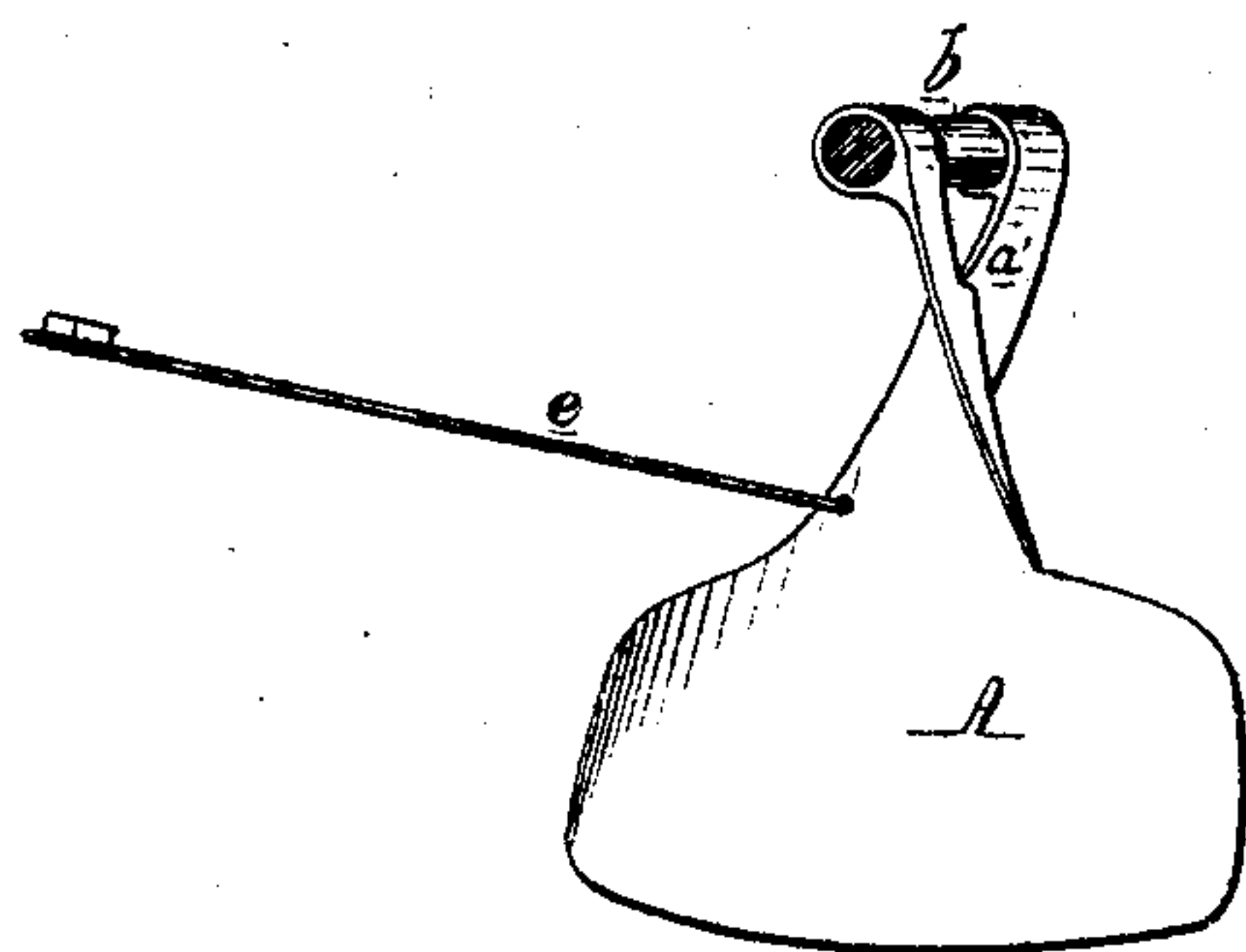
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



**Witnesses.**

Thomas McIlwain  
John K. Rupertus

David Bainbridge  
By his attys.  
Howson & Co.

# UNITED STATES PATENT OFFICE.

DAVID BAINBRIDGE, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN VIBRATING PROPELLERS FOR VESSELS.

Specification forming part of Letters Patent No. 135,257, dated January 28, 1873.

*To all whom it may concern:*

Be it known that I, DAVID BAINBRIDGE, of the city and county of Philadelphia, State of Pennsylvania, have invented a Propelling Device, of which the following is a specification:

The object of my invention is to impart to a single blade at the stern of a vessel, from a rotating shaft, a sculling movement resulting in the propulsion of the vessel.

I attain this end by connecting two arms, *a' a'*, of a blade, A, to the central portion *b* of an inclined crank, *b'*, forming part of a shaft, D, rotating on projections *d d* at the stern of the vessel, the blade being connected by a link, *e*, to a fixed pin on the vessel. On turning the shaft D the movement of the blade A in the water will be analogous to that of the blade of an oar to which a motion known as sculling is imparted. The arms *a* are secured to or form rigid continuations of the blade, the cranked portion *b* of the shaft turning freely in the upper end of the arms, which are arranged at a distance apart from each other, as shown in Fig. 2; hence, as the shaft rotates, two movements must necessarily be imparted to the blade, one being the lateral reciprocating movement imparted to the blade from the crank through the medium of the

arms, and the sudden reversal of the angle of the blade at each termination of the lateral motion; and it is by these combined movements that the desired sculling motion is obtained. This motion of the blade, however, could not be accomplished if it remained under the sole control of the cranked shaft, for the blade must necessarily be connected to the vessel in such a manner that it can be retained in its proper fore-and-aft position. This connection is made by means of the link *e*, which is so loosely jointed both to the vessel and to the blade that, while it exercises the desired fore-and-aft control over the blade, it in no way interferes with its propelling movement and action.

I claim as my invention—

The combination of the blade A and a shaft, D, to the central portion of the crank *b'* of which the blade is attached, as described.

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

DAVID BAINBRIDGE.

Witnesses:

WM. A. STEEL,  
HARRY W. DOUTY.