A. Bond.

Vibrating Propeller.

No. 6,533. Patented Jun. 19, 1849.

Fig. 3.

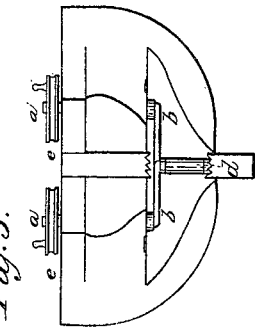


Fig. 4.

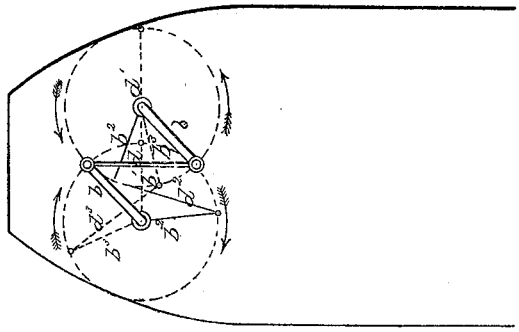


Fig. 2.

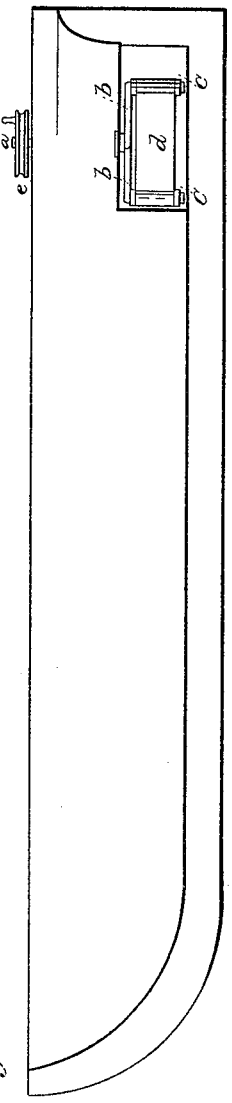
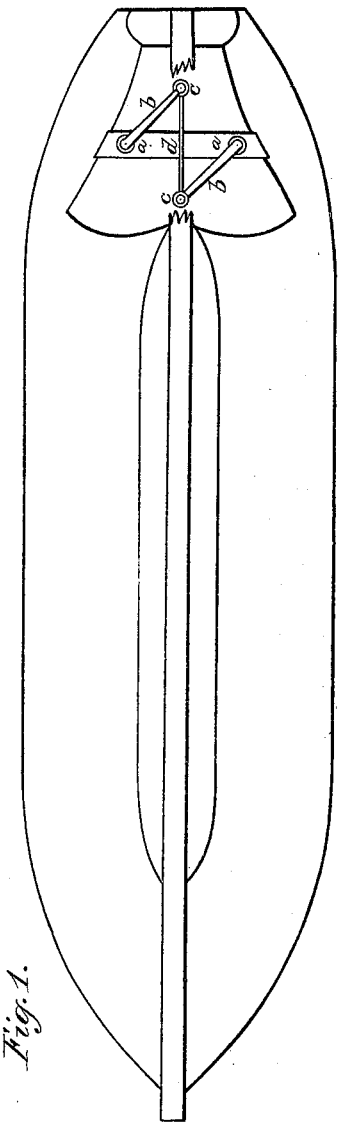


Fig. 1.



UNITED STATES PATENT OFFICE.

ALEXANDER BOND, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED SCULLING-PROPELLER.

Specification forming part of Letters Patent No. **6,533**, dated June 19, 1849.

To all whom it may concern:

Be it known that I, ALEXANDER BOND, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and Improved Apparatus for Propelling Vessels; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents the bottom of the vessel, together with the propelling apparatus; Fig. 2, the side of the same; Fig. 3, the stern thereof, and Fig. 4 shows several different positions of the propeller.

The apparatus consists of two vertical shafts *a*, two horizontal arms or levers *b*, permanently and firmly connected to the lower extremities of the aforesaid shafts, two other vertical shafts *c*, formed by the continuation of said arms or levers, and the propeller *d*. The length and breadth (or the amount of the surface) of the propeller are governed by the width of the vessel and the propelling-power required.

The whole apparatus is placed at or near the stern of the vessel, the shafts *a* passing through it, and the working-power is applied to pulleys or cranks *e* on their upper extremities, as represented on drawings or otherwise.

For the purpose of operating said propeller, the working machinery is applied in such a manner as to turn the shafts *a* in opposite directions, as indicated by the arrows on Fig. 4. In said Fig. 4 are shown four different positions of the propeller—viz., b d, b' d', b^2 d^2, and b^3 d^3. The first of these positions places the propeller in a straight line with the keel of the vessel, and is, in consequence of offering scarcely any resistance to the water, the one adopted when sails are used instead of the propeller. The second position b' d' is the one when the propeller exerts its greatest force. The others are simply changes of position incidental to the motion of the propeller, exerting more or less force, according to position.

The movement of the propeller may be best compared to the letter S or the figure 8.

I do not confine myself to any precise size or material, as these must be governed by circumstances.

What I claim as my invention, and desire to secure by Letters Patent, is—

The propeller *d*, suspended by and in combination with the shafts *a a*, the levers *b b*, and the shafts *c c*, constructed and moving (see Fig. 4) substantially in the manner described, and for the purpose hereinabove set forth.

ALEXANDER BOND.

Witnesses:
SAML. WETHERILL EARL,
FRANCIS BENNE.