J. Montgomery.

Screw Propeller.

No. 23,598. Patented Apr. 12, 1859.

Fig: 1.

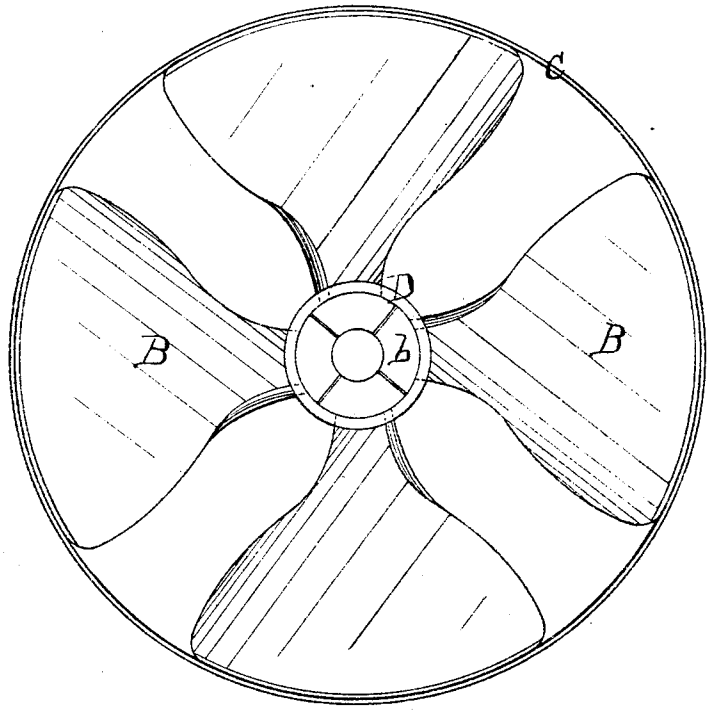


Fig: 2.

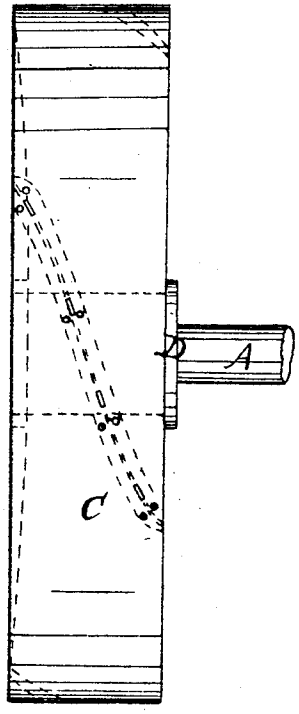
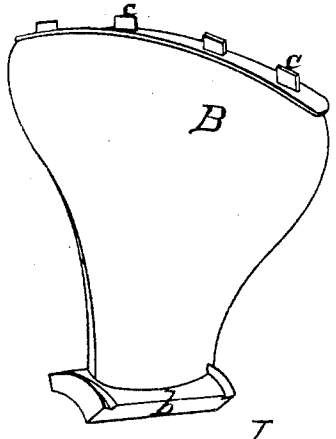


Fig: 3.



Witnesses.

James A. Gridley

Alstaught

Inventor.

James. Montgomery

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES MONTGOMERY, OF BALTIMORE, MARYLAND.

SCREW-PROPELLER.

Specification forming part of Letters Patent No. 23,598, dated April 12, 1859; Reissued April 22, 1873, No. 5,364.

To all whom it may concern:

Be it known that I, JAMES MONTGOMERY, of the city and county of Baltimore and State of Maryland, have invented a new and useful Improvement in Screw-Propellers; and I hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an end view and Fig. 2 a side elevation of a propeller embodying my improvement. Fig. 3 is a perspective view of one blade detached from the shaft and from the surrounding cylinder.

The subject of the said invention is a screw propeller composed of two or more blades surrounded by a cylindrical casing securely attached to the blades at their periphery and revolving therewith.

A, is the shaft of the propeller.

B, B, are helical blades cast separately and each formed with a segmental flange *b*, which flanges are made to clasp the shaft and are there firmly secured by bands D, so as to form the hub of the screw. The bands D, are by preference shrunk upon the hub *b b*, but may be formed with taper screw-threads adapted to fit corresponding threads formed upon the hub *b b*.

C, is a cylindrical casing surrounding the periphery of the blades and firmly attached thereto by tenons *c*, and riveted as shown. The chief object of this cylindrical casing is to afford mutual support to the ends of the blades and bind the whole structure firmly together in a similar manner to the tire of a carriage wheel so that a strain or shock imparted to any one of the blades is equally sustained by all. By this means I am enabled to produce a propeller of much greater strength and durability while its weight is much reduced, the support of the surrounding cylinder enabling the blades to be made extremely light. For the same reason the blades meet with much less resistance in clearing the water. The more rapid the motion of the vessel the coarser should be the thread of the screw by which it is propelled. The obliquity of the blades will therefore be adapted to accord with the model of the boat for which the screw is intended.

The connection between the ends of the blades and the cylindrical casing is required to withstand a severity of strain for which rivets alone would be entirely insufficient. The tenons *c*, are therefore formed in one piece with the blade and by engaging in corresponding mortises in the casing prevent such play or motion between the two as would sever and destroy the rivets. When the blades are constructed of wrought iron, the ends of the tenons will be upset or clenched on the outside of the casing but with a cast blade the tenons will be made in dovetail form and secured in the casing by calking or wedging from the outside. The cylindrical casing likewise serves to protect the blades of the screw from contact with canal banks, tow lines, drift wood, water grasses, and other matters which produce serious inconvenience in various ways well known to those engaged in canal navigation and acquainted with the use of the screw propeller; and is also beneficial in arresting the tangential motion of the water which involves much loss of power and produces disastrous effects upon the banks of canals and other narrow waters.

It is well known that in the early period of the application of the screw to the propulsion of vessels it was proposed to employ a form of screw similar to that invented by Archimedes for raising water, which consists of a spiral chamber coiled around an axis and open only at the ends. This was early superseded by a simple continuous spiral flange which possessed the advantage of admitting water more freely to its action. Subsequently the more perfect propeller of the present day was introduced which consists of a plurality of blades attached to a shaft in substantially one plane. This form of screw is found efficient and useful in its application to sea going vessels but the continuity of the spiral throughout its circumference being broken it is found necessary to make the blades extremely strong and massive and they are notwithstanding frequently broken by violent concussions of the sea or against solid bodies. The weakness of the stern frames of vessels as customarily constructed and the location of the screw propeller at the extreme stern (and sometimes without any outside bearing) render the weight of such a screw a serious inconvenience sometimes attended with disastrous consequences.

In some applications of the screw pro-

peller, and particularly in the navigation of canals and other small bodies of water in which the motion of the screw is comparatively slow much loss of power is experienced from the resistance which water offers to the rotation of a screw whose blades are of such thickness as has hitherto been found essential to strength. I have accordingly devised a method of applying an exterior cylindrical casing to a screw composed of a plurality of blades and attaching it in such a manner to the peripheries of the said blades that any sudden or excessive strain on either of the blades is sustained by the said cylindrical casing and by it distributed equally over the entire structure, the said casing serving also the combined purposes of preserving the blades from contact with passing objects and arresting the tangential motion of the water which involves loss of power and causes serious injury to canal banks.

I claim as new and of my invention and desire to secure by Letters Patent.

A screw-propeller composed of a plurality of blades attached to their shaft in one plane or nearly so, when surrounded by a containing cylinder firmly attached to the peripheries of the said blades substantially in the manner and for the purposes set forth.

In testimony of which invention, I hereunto set my hand.

JAMES MONTGOMERY.

Witnesses:

OCTS. KNIGHT,

EDM. F. BROWN.