(No Model.) 2 Sheets—Sheet 1.

# D. MORGAN.

## SCULLING AND PROPELLING MECHANISM.

No. 589,974. Patented Sept. 14, 1897.

Fig. 1.

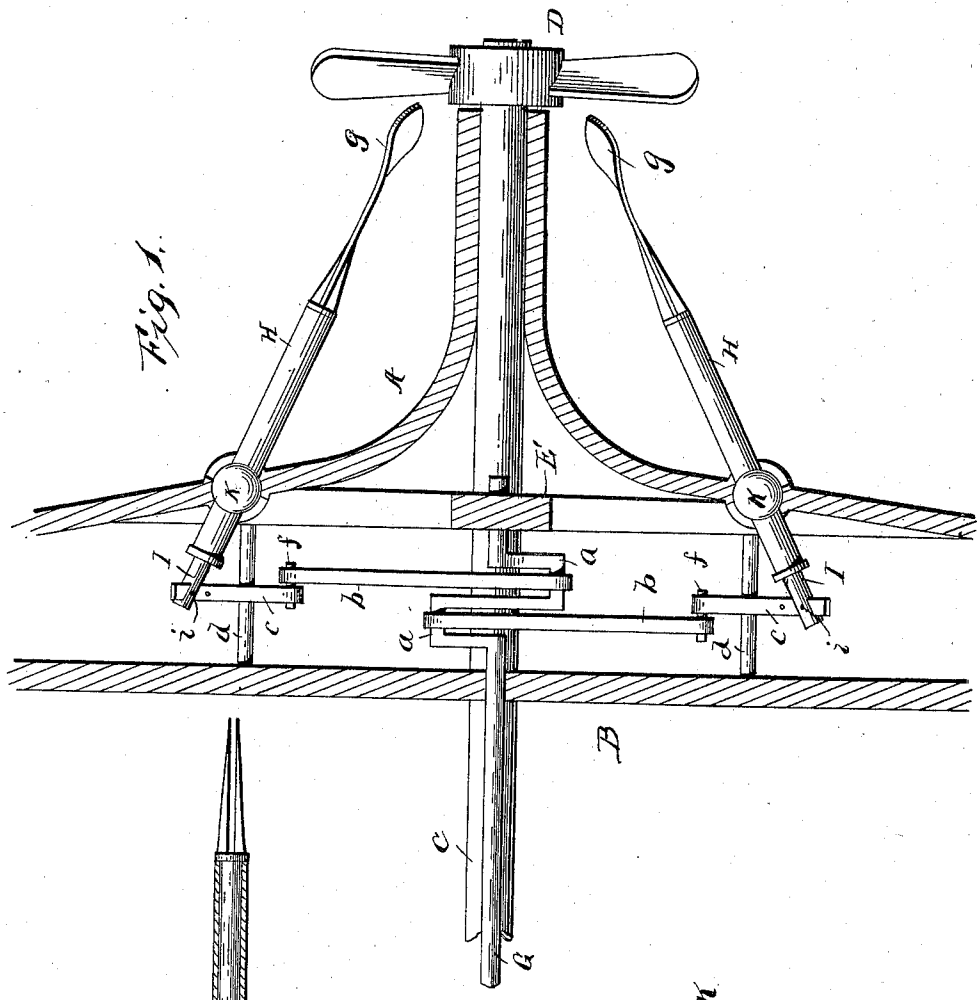



Fig. 3.

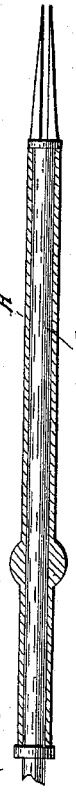



Fig. 5.

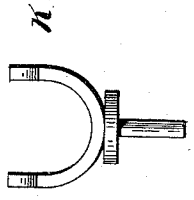
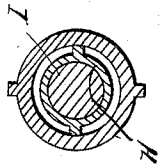



Fig. 4.




K

Witnesses
E. C. Duffy
C. M. Werle

Inventor
Decatur Morgan
per O. E. Duffy
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

# D. MORGAN.

## SCULLING AND PROPELLING MECHANISM.

No. 589,974. Patented Sept. 14, 1897.

Fig. 6.

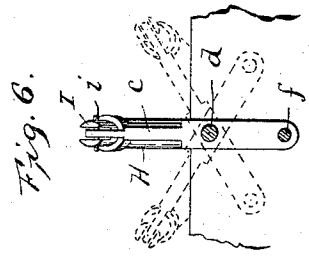
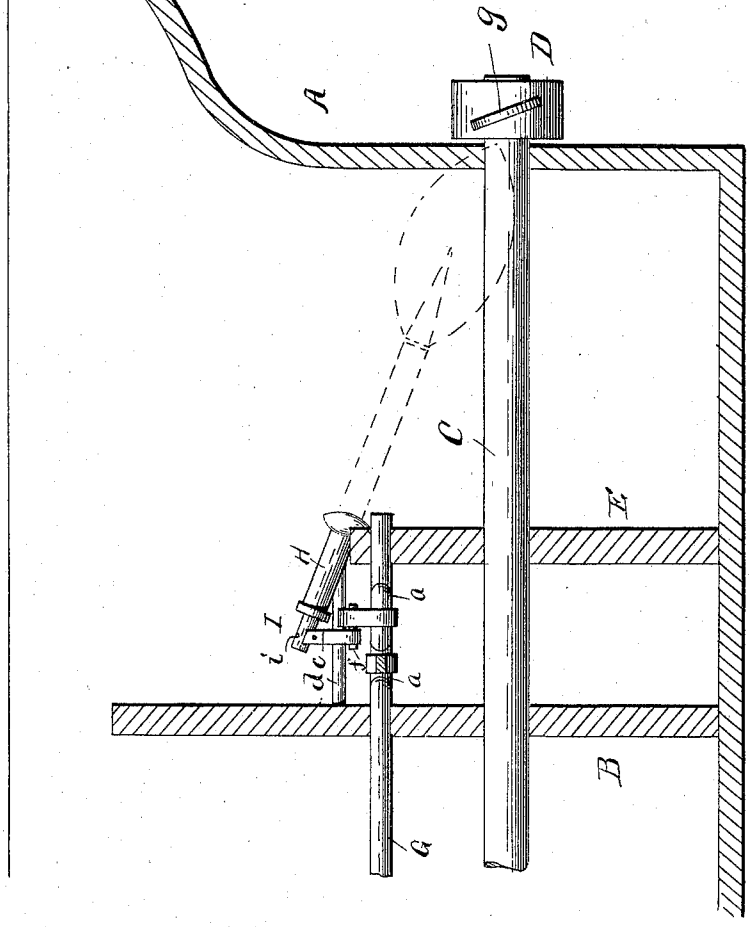



Fig. 2.




Witnesses
E. C. Duffy
C. M. Werlé

Inventor
Decatur Morgan
per O. E. Duffy
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

DECATUR MORGAN, OF WASHINGTON, DISTRICT OF COLUMBIA.

## SCULLING AND PROPELLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 589,974, dated September 14, 1897.

Application filed April 8, 1896. Serial No. 586,743. (No model.)

*To all whom it may concern:*

Be it known that I, DECATUR MORGAN, of Washington, District of Columbia, have invented certain new and useful Improvements in Sculling and Propelling Mechanism; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention has relation to the propulsion of marine or other vessels; and it has for its object to propel and accelerate the speed of vessels either by my particular invention alone or in combination with what is known as the "screw" or other propeller.

A further object of my invention is to utilize to a maximum the well-known principle involved in sculling boats and adapt it to machinery, by means of which an unusual amount of power is exerted as compared with a minimum amount of cost.

A further object is to so construct, locate, and arrange the paddles or blades of my sculling apparatus as to compel or force the water against the screw-propeller that its grip in the water is increased and intensified.

My invention consists in mounting sculling-blades and operating them in such manner as to produce by the same stroke the action and power of the oar while rowing and of the paddle or blade while sculling.

It further consists in the arrangement of the sculling-blades in such manner that the rocking motion ordinarily produced by sculling is neutralized, by which one blade counteracts the force of the other, and by their opposite resistance additional power is imparted to the forward movement of the vessel.

The invention further consists in the various parts and mechanisms hereinafter more fully described, and pointed out in the claims.

It is well known in the practice of propelling vessels that an eddy is formed in the wake of the ship or immediately at the stern thereof, and particularly when the ship or boat is going at a rapid rate of speed, and this eddy is produced by the rapid and forcible displacement of the water, and before the water has time to replace itself the propeller in line of its progression is necessarily placed in this eddy, and by the looseness and insolidity of the water the propeller does not get a solid grip and therefore loses much of its power. Furthermore, the propeller-blade boils or agitates the water in proximity of the eddy, and by the combined action of the displacement of the water by the ship and the boiling and churning action of the propeller the water is rendered loose and therefore the propeller-blades cannot take hold and act as if the water were solid. Therefore to avoid these objections or to overcome them as far as possible are further objects of my invention.

Persons familiar with the action of sculling are aware that the blade does not agitate, loosen, or churn the water, but acts oppositely and travels in a circuitous track, forcing the water from it on the wedge or screw principle against the propeller, the sculling-blades being placed in front of the screw-propeller in such position and proximity that the water forced by the sculling-blades must necessarily come in contact with the propeller-blades, and thus the evil effects of the churning and loosening is largely prevented.

The sculling-blades are preferably placed at about an incline of forty-five degrees, and in propelling or sculling motion they travel about one-third the arc or revolution of a circle. The action of "feathering the blade" is done by the twist imparted by the levers, in which there are four motions: first, by the oscillating arms or levers; second, by the paddle-shaft; third, by the action of the sleeve, and, fourth, by the action of the union-bearing. Close observation will discern that there is a sort of human arm and wrist movement. The throw of the paddle-blade is greater than that imparted by the hand, the blade taking a wider sweep or range. After the blade passes a short distance to one side of its center and having performed its sculling action it then takes on the pushing or driving action of the oar, so that in its sweep there is comparatively no dead-center, because the blade is cutting the water diagonally at an angle proportionate to the speed of the vessel. The sweep of the paddle-blade may be controlled by the fulcrum and the length of the shaft and its operating-pitman,

and the same may be said of its depth in the water. The paddle-shaft and the sleeve travel in opposite directions, which produce the wrist action.

The paddle-blade may have a curved or twisted face, or may be a spoon-blade, and at such sweep or pitch as may be desired, and its oscillation may be increased or diminished, as may best subserve its purpose, the sweep being controlled by the length of the rock-shaft and the change of its fulcrum.

In the drawings the same letters of reference indicate like parts in the different figures, in which—

Figure 1 represents a sectional plan view on a central line just inside the vessel near its stern. Fig. 2 is a central vertical section. Fig. 3 shows the paddle working shaft and bifurcated clamps for holding the paddle, also the sleeve in longitudinal section. Fig. 4 is a cross-section of one form of swivel or universal joint, the paddle-shaft, and sleeve. Fig. 5 is a view of another form or modification of swivel. Fig. 6 is an end view of the oscillating arms or levers, showing in dotted lines their limit of movement.

A is the shell or stern portion of a ship, and B the stanchion or cross-beam. C is the propeller-shaft, and D the propeller. E is the pedestal block for the support of the compound crank-shaft that operates the paddle.

G is the paddle-shaft, and *a a* the cranks. The stern end of the shaft G is journaled in the pedestal E, which will be provided with suitable braces or stays. *b b* are the pitmen or connecting rods, and *c c* are the oscillating arms or levers. *d d* are pintles or rods upon which the oscillating arms or levers work.

It will be observed, as shown in Fig. 6, that the pintles *d* form the journal bearing or pivot upon which the oscillating arms or levers operate. It will also be observed that the throw or sweep of the paddles may be regulated by changing the fulcrum in the oscillating arms or levers and also the dip of the paddles or their depth in the water.

*f f* are crank-pins, which connect the pitmen to the oscillating arms or levers.

*g g* are the paddles or blades, which may be of any approved design.

H H are the sleeves, through which the paddle-shafts I work, and K is the ball or other swivel-joint.

In operation the speed of the vessel is accelerated by means of the paddles, which are oscillated by the paddle-shaft and oscillating sleeve surrounding the same, the said sleeve and shaft having an independent action in relation to each other, but both receiving power from an oscillating arm connected to the crank-shaft, which is moved by suitable motive power. These several parts connected and arranged impart a wrist and arm motion as used in sculling.

The dotted lines in Fig. 2 show the position of the flat paddle when about to take its return stroke. When twin screws are used in a ship, the paddle-blades are correspondingly arranged.

It will be understood that the usual tight joints are made where the paddles pass through the shell of the vessel, and while Fig. 1 shows twisted paddles any approved forms may be used.

The journal or pivot rod *d*, that passes through the oscillating arms or levers *c*, with the sleeve and universal joint and shaft I, perform a very peculiar motion and is a very important part of my invention.

When the dip of the paddle is to be altered, the pin *i* and the end of shaft I will be changed to a hole in the oscillating arm or lever, by which the sweep as well as the dip will be altered to a greater or less degree. It is preferable to keep the ends of the paddles in as close proximity to the propeller as possible, as they drive the water to the propeller and increase its solidity.

It will be observed that many slight changes may be made in the forms, constructions, and arrangements of the parts described without departing from the spirit and scope of my invention. Hence I do not wish to limit myself to the exact construction herein set forth, but consider myself entitled to all such changes as fall within the spirit and scope of my invention.

What I claim is—

1. An apparatus for accelerating the speed of vessels by means of paddles, consisting of the oscillating paddle-shaft, an oscillating sleeve surrounding the same, the sleeve and shaft having independent working bearings in relation to each other, the universal joint and the connected oscillating arm operated by suitable power, as set forth.

2. In an apparatus for accelerating the speed of vessels, the combination of the crank-shaft, the oscillating arm or lever, a pitman-rod connecting said crank and arm, said arm being journaled near its center and adjustably connected to the paddle-shaft, the paddle and the swivel-bearing, the parts being adapted to regulate the sweep and dip of the paddles as set forth.

3. The combination in an apparatus for accelerating the speed of vessels comprising the crank-shaft, the oscillating arm or lever, connecting-rod connecting the crank and arm, the paddle-shaft connected to said arm, the latter connection being adjustable to raise and lower the paddle-shaft, the sleeve surrounding said shaft, the universal joint carrying said sleeve, all arranged for joint operation, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

DECATUR MORGAN.

Witnesses:
O. E. DUFFY,
E. C. DUFFY.