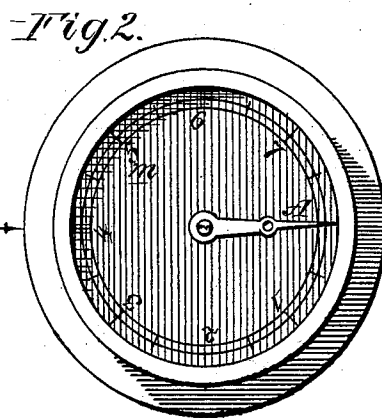
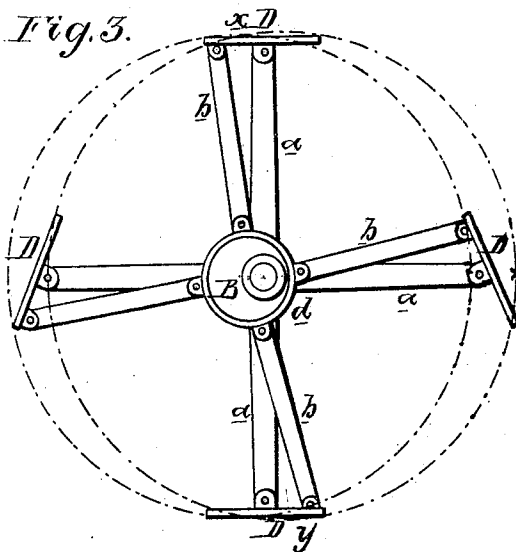
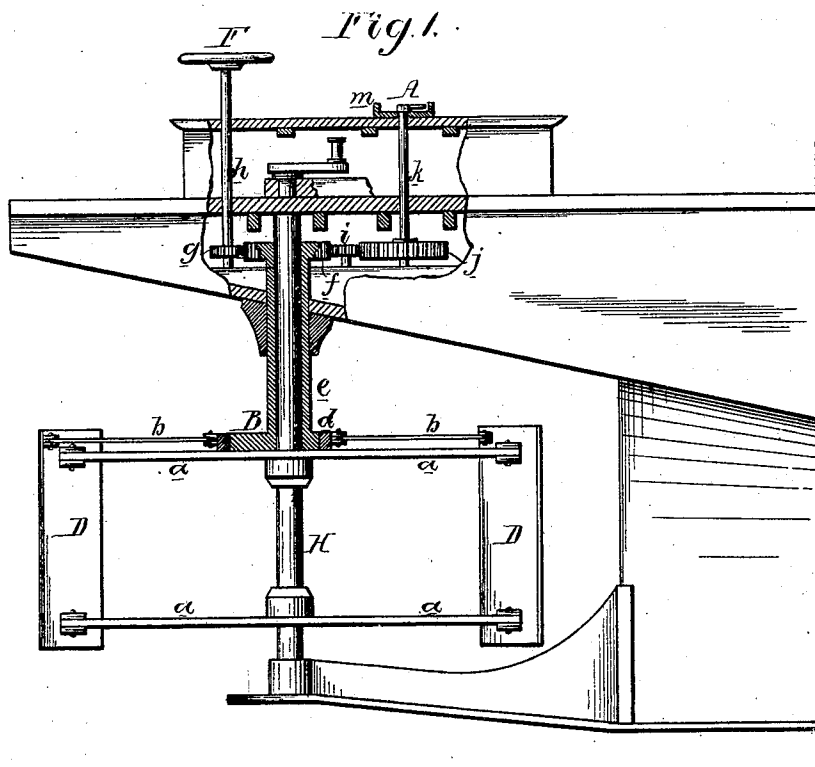


F. G. FOWLER.

INDEX FOR STEERING-PROPELLER.

No. 177,064.

Patented May 9, 1876.



Witnesses, Hubert Howson  
Harry Smith

Frank G. Fowler  
by his Atty.  
Howson and Son.

# UNITED STATES PATENT OFFICE.

FRANK G. FOWLER, OF BRIDGEPORT, CONNECTICUT.

## IMPROVEMENT IN INDEXES FOR STEERING-PROPELLERS.

Specification forming part of Letters Patent No. **177,064**, dated May 9, 1876; application filed February 3, 1874.

*To all whom it may concern :*

Be it known that I, FRANK G. FOWLER, of Bridgeport, Fairfield county, Connecticut, have invented an Index for Steering-Propellers, of which the following is a specification:

My invention relates to an improvement in that class of marine propellers which may be swiveled or turned around in a horizontal-plane by the steersman, or so that their propelling force can be exerted in a direction corresponding with any point of the compass, for the purpose of steering, maneuvering, and backing boats provided with such propellers. The object of the invention is to enable the steersman under such circumstances to properly manipulate his helm. I attain this object by having an index or pointer located in sight of the steersman, and so adjusted and geared to, and combined with, the said propeller as to point out to him the direction in which the thrust or propelling force is exerted. For example, if the helm be so turned that the propeller is in a position to exert its propelling force directly ahead; the index will point ahead; but if it be so turned that the propelling force is directed astern, the index will point astern, and so of any point to which the propelling force can be turned, the index will point in the same direction, thus serving as an infallible guide to the steersman when turning his helm for the purpose of steering, maneuvering, and backing his boat. The above becomes apparent when it is considered that the variety of evolutions in steering, maneuvering, and backing that boats provided with such propellers are capable of performing is accomplished not by the operation of a rudder or reversing or modifying the engine, but solely and entirely by the different directions in which the thrust of the propeller is exerted.

Having given the general nature of my invention, I will now proceed more fully to explain its arrangement and operation; and in order that it may be more fully understood, I will briefly describe in the outset one of the propellers to which my improvement relates.

To horizontal arms *a*, fixed to a vertical shaft, *H*, are provided blades *D*, each of which is connected by a rod, *b*, to the strap *d* of the eccentric *B*, the latter being secured to the

lower end of the sleeve *e*, provided at its upper end with the cog-wheel *f*, into which gears a small gear-wheel, *g*, at the lower extremity of the shaft *h* of the steering-wheel *F*. As the shaft of the propeller revolves from the power of the engine the blades are caused by the eccentric to oscillate on their pivots in such a manner as to exert a propelling force, and the propelling force is always exerted in the direction of the short radius of the eccentric and from the shaft—for instance, in the direction of arrow 1. That being the case, the steersman can, by means of turning the eccentric with the helm *F*, cast the propelling force to any point of the compass, thus causing the boat to move forward or backward in a direct line, or to the right or left in a curve, or turn in either direction on its own center. As the propeller is submerged and hid from view the steersman cannot tell, on starting, which way the vessel will move, so that there will be a constant risk of collision, when there is little sea-room, before the direction of the thrust of the propeller can be determined by the motion of the hull, and in endeavoring to back his boat, which is necessary in landing, he could not tell when the propeller is reversed; and there are similar difficulties respecting all other evolutions. These serious defects are remedied by my invention, and the steersman enabled to operate his helm so as to produce any desired evolution or maneuver with absolute certainty.

The cog-wheel *f* at the upper end of the sleeve *e* gears into the pinion *i*, which, in turn, gears into the wheel *j* on the spindle *k*, to which the index *A* is attached. (See Fig. 1.) The wheel *f* and *j* have the same number of teeth; therefore the slightest movement of the eccentric *B* will be followed by a corresponding movement of the index *A* in the same direction, and a revolution of the eccentric will produce just a revolution of the index. The said index is adjusted by being set in the direction of the short radius of the eccentric, which coincides with the direction of the thrust of the propeller, and the gearing is such that it will always correspond with it and serve as an unerring guide to the steersman in the manipulation of his helm for the maneuvering and backing of the said vessel.

For, if the helm be turned so that the index is parallel with the keel and points ahead, the boat will be propelled ahead. If it make an angle of about fifteen degrees with the keel, either to the right or left, the boat will be steered to the left or right, and with a force equal to that produced by the maximum effect of a rudder. If it make an angle of more than fifteen degrees with the keel the boat will be moved in curves that cannot be produced by the maximum effect of a rudder or any number of rudders. If it be turned so as to make an angle of ninety degrees with the keel the vessel will be caused to revolve on its center or moved directly sidewise, depending on the location of the propeller on the boat. If the index be made to point backward the boat will be backed, and that, too, without reversing the engine.

In like manner, my invention can be applied to a swiveling jet-propeller—that is, to one whose nozzle can be swung around to any point of the compass—or to a swiveling screw-propeller, or to any propeller which can be made to exert its propelling force in any direction, for the purpose of steering, maneuvering, and backing, by only gearing the index to the propeller, so that it will point out to the steers-

man the direction in which the propelling force is exerted.

I propose to combine a circular scale, *m*, Fig. 2, having characters or figures marked upon it, with the index *A*, so that a lookout aloft, or an officer in a distant part of the vessel, can, by signaling the characters to the helmsman, indicate how the vessel should be maneuvered.

What I claim as new and useful, and wish to secure by Letters Patent, is—

1. The index *A*, which indicates the direction of propulsion at all positions of the propeller, in combination with a marine propeller whose thrust can be exerted in a direction corresponding with any point of the compass, substantially as described.

2. The scale *m*, in combination with the index *A* and a propeller whose thrust can be exerted in any direction, substantially as set forth.

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

FRANK G. FOWLER.

Witnesses:

WM. A. STEEL,  
HARRY SMITH.