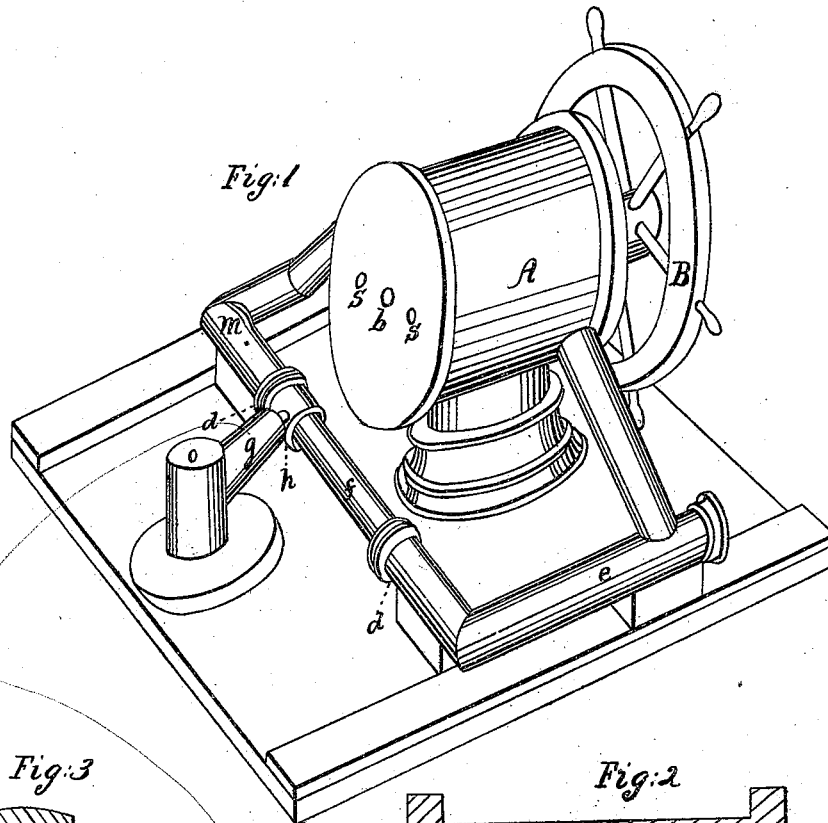


*H. O. Cook.*

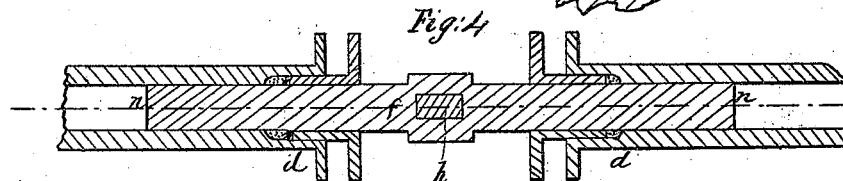
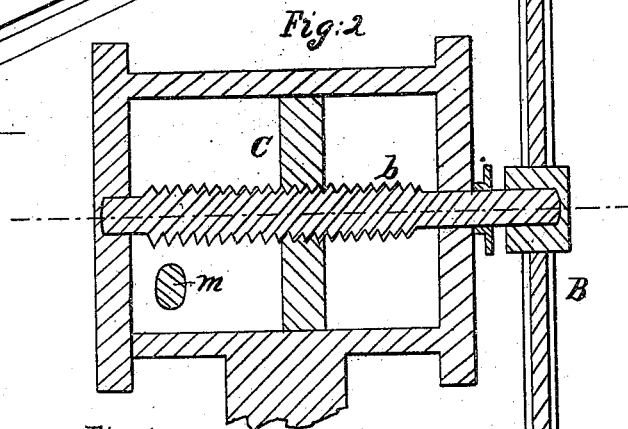
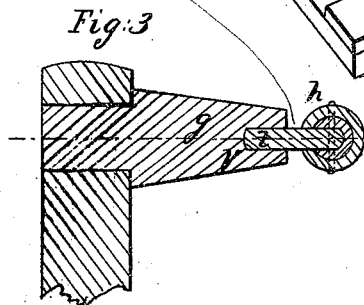
*Steering.*

*N<sup>o</sup> 52,970.*

*Patented Mar. 6, 1866.*



*Brake  
key mech.  
to*



*Witnesses*  
*William H. Clifford*  
*Samuel H. Lase*

*Inventor*  
*Henry M. M.*

# UNITED STATES PATENT OFFICE.

HENRY O. COOK, OF PORTLAND, MAINE.

## IMPROVED HYDRAULIC STEERING APPARATUS.

Specification forming part of Letters Patent No. 52,970, dated March 6, 1866.

*To all whom it may concern:*

Be it known that I, HENRY O. COOK, of Portland, in the county of Cumberland and State of Maine, have invented a new and useful Apparatus for Steering Vessels by the Employment of Hydraulic Power; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a perspective side view of my invention; Fig. 2, a section of the cylinder; Fig. 3, a section of the rudder-head, tiller, and joint *h*; Fig. 4, a section of the tubes *e* and *m* and rod *f*.

The same letters indicate like parts in all the figures.

The object of my invention is to produce an apparatus for steering vessels in which the rudder will be held firmly and securely at any position, and yet be turned by the hand with as much ease as by the ordinary means in use.

My invention consists in the use of a cylinder, a piston, communicating tubes, and an extension-tiller, all constructed and arranged in the manner hereinafter to be described, and in the use or employment in this device of hydraulic power as a means of holding the rudder at any desired angle without the exertion of human strength upon the wheel.

*A* represents a cylinder, in which is fitted the piston *C*, moving on the screw *b*.

Into the cylinder, and at or near either end thereof, are inserted the tubes *e* and *m*. At the points *d d* in the tubes are constructed the stuffing-boxes, through which works the rod *f*, with plungers *n n* at either extremity.

To the center of the rod *f* is fastened the extension-tiller *g* by means of the joint *h*. The tiller is constructed of two parts, one forming a sleeve or socket, into which the other portion fits or slides.

*t* and *v* indicate two parts of the tiller. This is so arranged in order to accommodate the tiller to the different positions in which it may be placed—as, for instance, requiring, with my arrangement, a greater length of tiller when the helm is up or down than when amidships.

It is well known that under circumstances of a heavy sea if a rudder was held so rigidly

as not to yield somewhat to the seas the consequence would be its loss or fracture. This necessity of the rudder's yielding somewhat to the waves is provided for in the combination of the rod *f*, the extension-tiller *g*, and the joint *h*. By these means when a heavy blow is brought against the rudder it will turn somewhat, and thus ease itself of the strain, but immediately resume its position when the pressure is removed, the wheel *B* meanwhile remaining motionless.

When the wheel *B* is left in any position no force upon the rudder can cause the wheel to revolve. My invention is intended to be so constructed that three turns of the wheel will put the helm hard up or down.

Through the piston *C*, and fixed into the ends of the cylinder *A*, are the guides *s s*, to give evenness to the passage of the piston.

The operation of my apparatus for steering vessels is as follows: The cylinder and tubes being filled with oil or any proper liquid, the turning of the wheel *B* will force the liquid through one of the tubes and move the rod *f* out of one tube and into the other to the same extent, and also diminish the quantity of liquid on one side of the piston *C* and increase the quantity on the other side in the same proportion. This slides the rod *f* and turns the rudder-head by means of the tiller. At whatever inclination the tiller is left there still remains a quantity of liquid on either side of the piston *C*, so that it is always held in its place securely by hydraulic power.

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

1. The use, in the above-described apparatus, of hydraulic power for the purpose of turning a ship's rudder and holding it in any desired position.

2. The combination of the extension-tiller *g*, the joint *h*, and the rod *f*, for the purpose of enabling the rudder to yield to the waves, as described.

3. The combination of the cylinder *A*, piston *C*, tubes *e* and *m*, rod *f*, and tiller *g*, all as and for the purpose specified.

HENRY O. COOK.

Witnesses:

WILLIAM H. CLIFFORD,  
HAUSER W. GAGE.