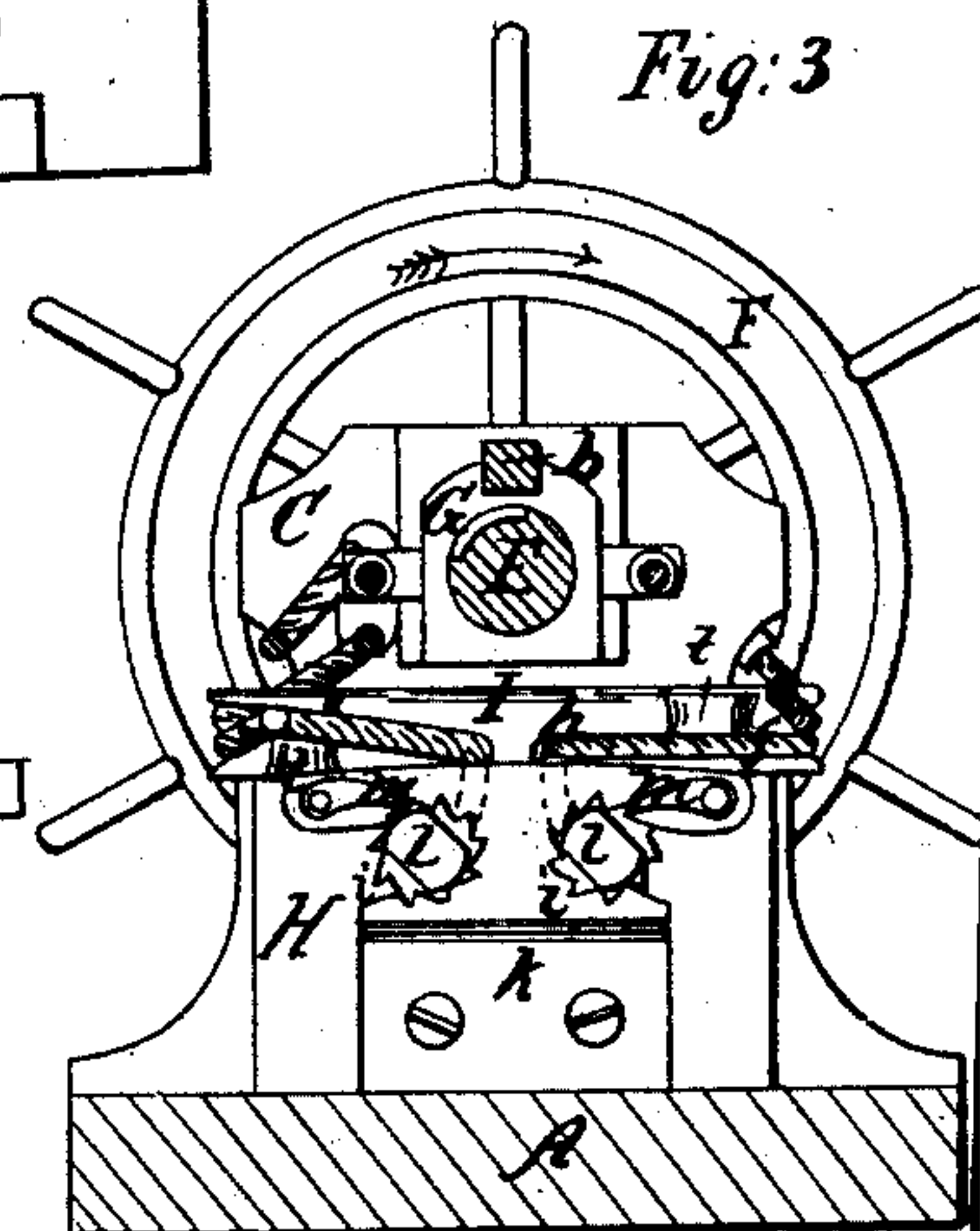
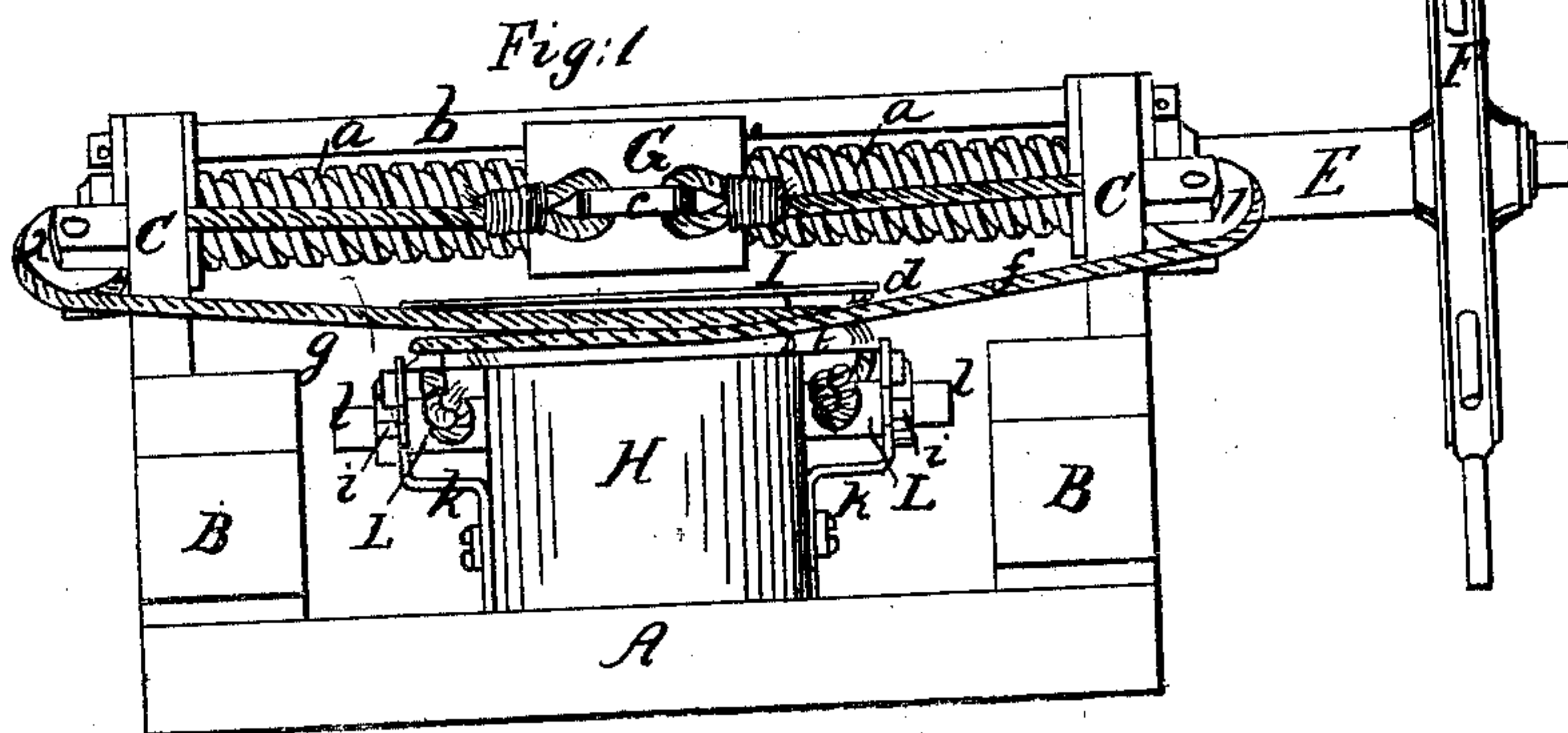
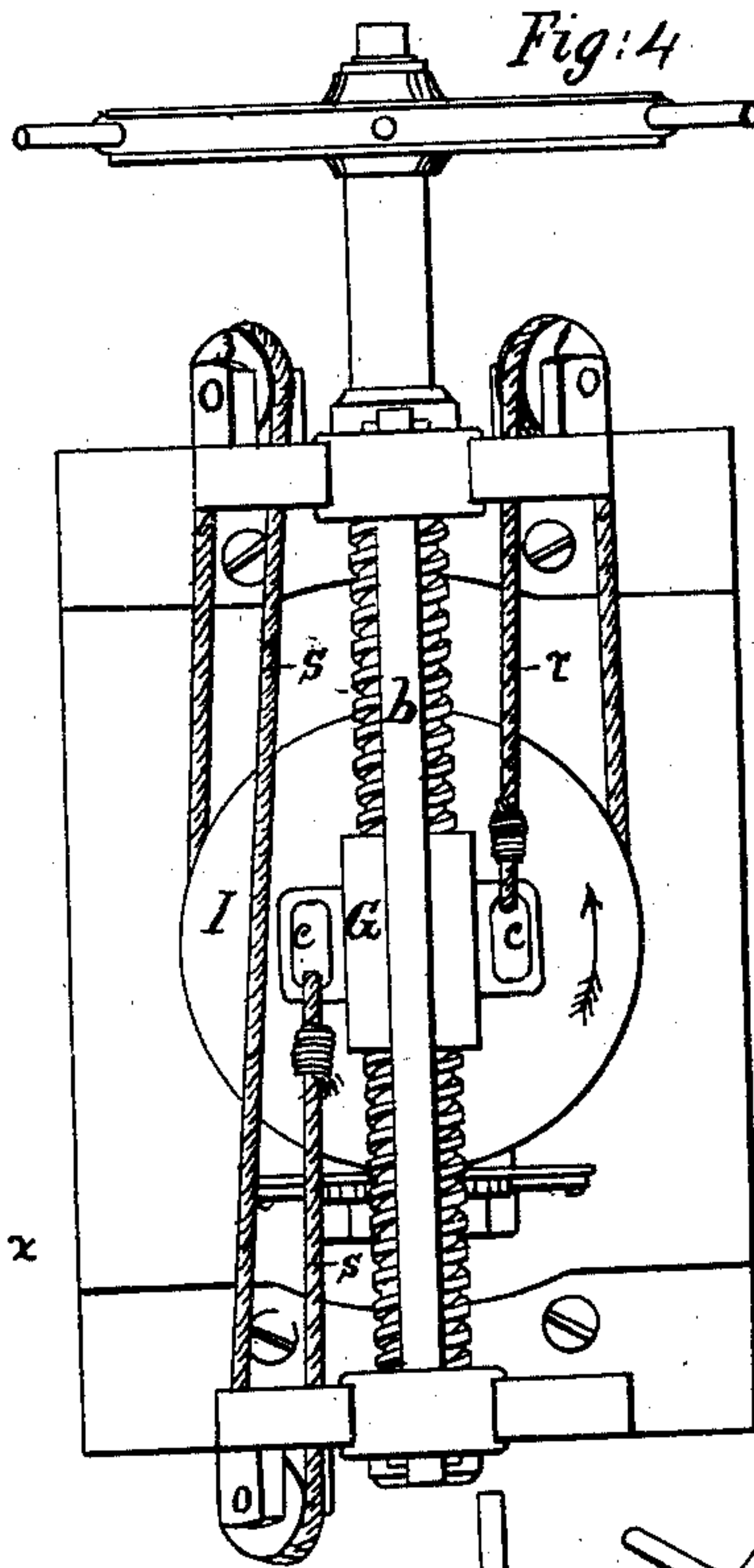
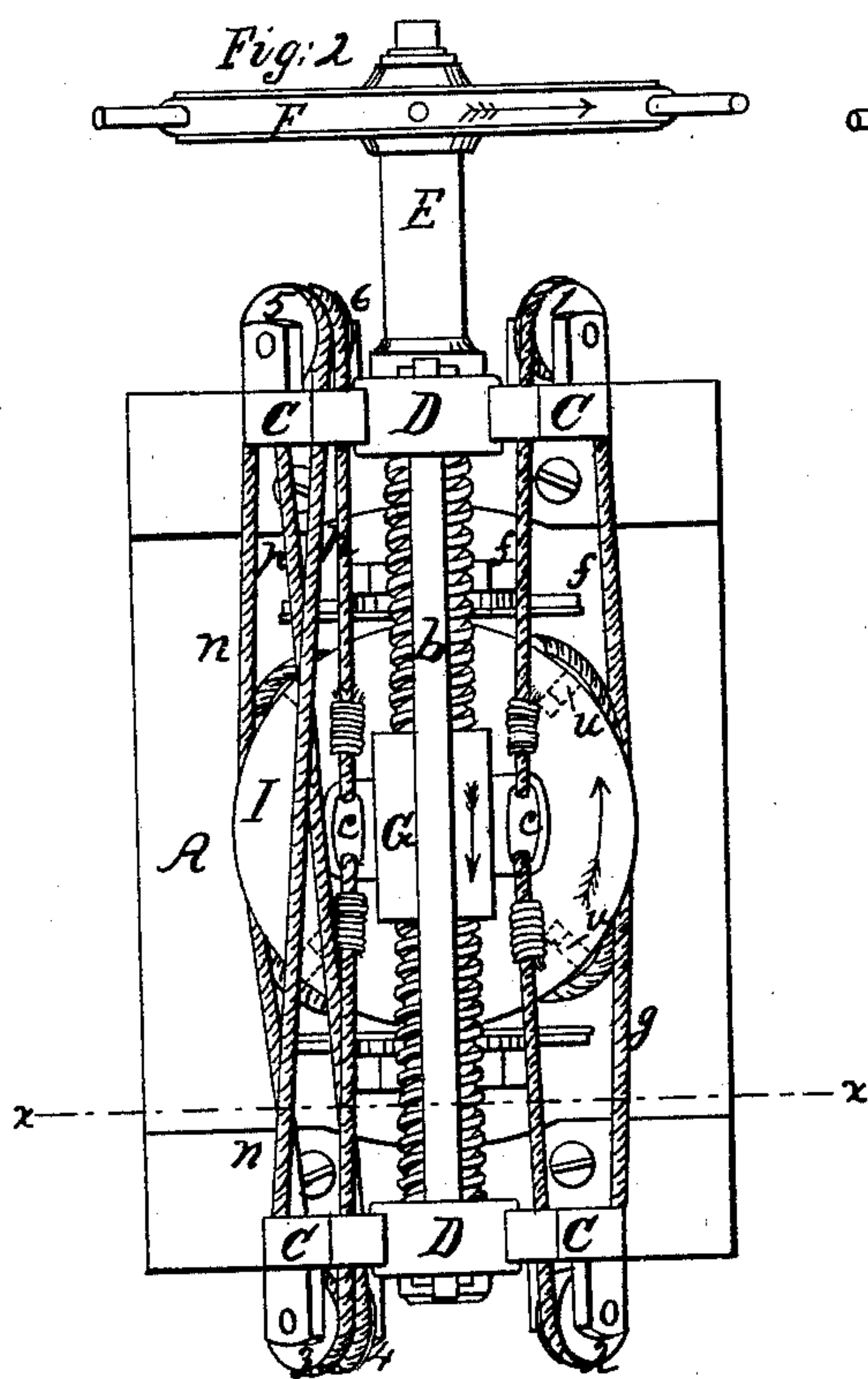


*S. B. Cram & C. Weed.*

*Steering.*

*N<sup>o</sup> 20,239.*

*Patented May. 11, 1858.*





# UNITED STATES PATENT OFFICE.

S. B. CRAM AND C. WEED, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO S. B. CRAM AFORESAID.

## STEERING APPARATUS.

Specification of Letters Patent No. 20,239, dated May 11, 1858.

*To all whom it may concern:*

Be it known that we, STEPHEN B. CRAM and CHARLES WEED, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Steering Apparatus for Vessels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of the steerer. Fig. 2 is a plan of the same. Fig. 3 is a transverse vertical section on the line *x, x*, of Fig. 2. Fig. 4 is a plan showing a different arrangement of the ropes which connect the nut to the rudder head as will be explained hereafter.

The rigid connections between the rudder post and the wheel in the mechanical steerers heretofore constructed render the parts extremely liable to break, and this occurs at times when it is most necessary that the integrity of the apparatus be maintained; to remedy this we employ ropes or chains to communicate the power applied to the wheel to the rudder head, as the means for repairing or replacing these is generally at hand on board of every vessel.

That others skilled in the art may understand and use our invention we will proceed to describe the manner in which we have carried out the same.

In the drawings A represents the deck of the vessel from which rise two heavy stanchions B. On these are secured the housings C in which rest the two boxes D, that form the bearings of the shaft E. This shaft carries the wheel F and has cut on it the screw *a*. A nut G, having a corresponding female screw cut in it embraces the screw *a*. It is prevented from turning around and is steadied in its motions by the guide rod *b*, placed immediately above it, which is secured at each end in one of the boxes D, and fits in a groove in the upper side of the nut. Thus as the wheel is revolved the nut G is caused to move longitudinally along the shaft E. A lug *c* is cast on each side of the nut G to which are attached the ropes which communicate the motion from the nut to the rudder head.

H is the head of the rudder post to which is secured a cap I, having in its edge a groove *d*, to receive the ropes which we reeve in the following manner: Pulleys 1, 2, 3, 4, 5, and

6 are secured to the housings C. Suitable holes are made through the housings for the ropes to pass through. The rope *f* is attached to the nut G and is led over the pulley 1. It is then passed partly around the cap I, (resting in the groove *d*.) It then passes down through a hole in the edge of the cap I at *h*, Fig. 3, and is fastened to a small windlass L, secured to after side of the rudder post. This windlass is for taking up the slack of the rope as it stretches and may be operated while the steerer is in use. There is one such windlass for each rope—that is, two at the after and two at the forward side of the rudder post. As they are similar I will describe but one. They are supported in pairs in a broad bent arm *k*, which is attached to the rudder post. The windlass is a short stout shaft L which has its bearings in the piece *k* and in the rudder post itself. This shaft projects beyond the piece *k* and has on it a ratchet wheel *i*. A pawl *m* engages with this ratchet and retains the shaft after it is wound up; the shaft is turned by a key applied to the end of it at *l*, or in any other convenient way. Another rope *g* is attached to the nut G, and is led over the pulley 2, and is then attached to a windlass L on the front part of the rudder post. On the opposite side of the shaft E, a rope *n* (in red Fig. 2,) is attached to the nut G, and is led over the pulley 3, then forward over the pulley 5, thence back to a windlass L at the after part of the rudder post; to this same side of the nut G, is attached another rope *p* which is led forward around the pulley 6, then back around the pulley 4 and thence forward to a windlass L on the forward side of the rudder post. All these ropes pass through holes *h* in the edge of the cap I before they are attached to their windlasses. When arranged as above as the wheel is turned in the direction of its arrow the nut G is caused to travel aft on the shaft E. This draws on the cord *f* attached to the after part and on the cord *p* attached to the forward part of the cap I, and revolves it in the direction of its arrow. As the strain is brought on both sides of the nut G in the same direction little or no tension can be given to the nut. When the motion of the wheel F is reversed and the nut is drawn forward or in the opposite direction the ropes *g* and *n* are drawn upon in a similar manner.



In Fig. 4 is shown a more simple way of reeving the ropes. The rope *r* is arranged in a manner similar to the rope *f* in Fig. 2, and the rope *s* is led from the nut G over a pulley 2 on the after housing, thence over a pulley 3 at the forward end and then back to the cap I, to the rear part of which it is attached. It will be perceived that in this latter arrangement the pull is all on one side or the other of the nut G. This causes the nut to bear unequally on the threads of the screw *a*; for this reason the former plan is that which we prefer. Instead of ropes, chains or raw hide bands may be employed. The elasticity of the ropes will generally be sufficient to prevent any sudden surge or strain of the rudder from being communicated with too much violence to the nut and screw, but when a more yielding connection is required, we make use of the following device: A piston *u*, (dotted in Fig. 2) having a head *t* (Fig. 3) which rests in the groove *d*, is inserted in the cap I, with an india rubber or other spring behind it. One of these is inserted near the hole *h* where each rope passes down to its windlass, in such a manner that the rope shall rest on the head *t*, which serves as a spring bearing under it, any strain on the rope acting to compress the spring behind the piston *u*.

Some of the details of this steerer may be varied without departing from the spirit of our invention. For instance, in lieu of the cap I a yoke or tiller may be secured on the rudder head to which to attach the ropes. We may here mention some of the advantages which we consider this steerer as possessing over others with which we are ac-

quainted: It is cheap and simple in its construction, having but one screw shaft and one nut. If it should happen not to be immediately over the center of the rudder post, either from being improperly set or from the warping of the post, it will not materially affect its operation. By dispensing with gears and rods we avoid much unpleasant noise and jar, particularly when the vessel is before the wind. The parts most liable to be deranged or worn out in other mechanical steerers require a mechanic to repair them, while in this the sailors themselves can make the repairs from the materials always at hand on board a vessel; this is an advantage which will be particularly appreciated on long voyages.

What we claim as our invention and desire to secure by Letters Patent as an improvement in mechanical steerers is—

1. The screw *a* and nut G, in combination with the ropes operating in the manner substantially as herein set forth.

2. And in combination with the above we claim the within described tightening apparatus, or any equivalent thereof arranged in the manner set forth for the purpose specified.

3. And in combination with the above described arrangement of ropes or chains as applied to "mechanical steerers" we claim the employment of springs operating as described for the purpose specified.

S. B. CRAM.  
CHAS. WEED.

Witnesses:

THOS. R. ROACH,  
P. E. TESCHEMACHER.