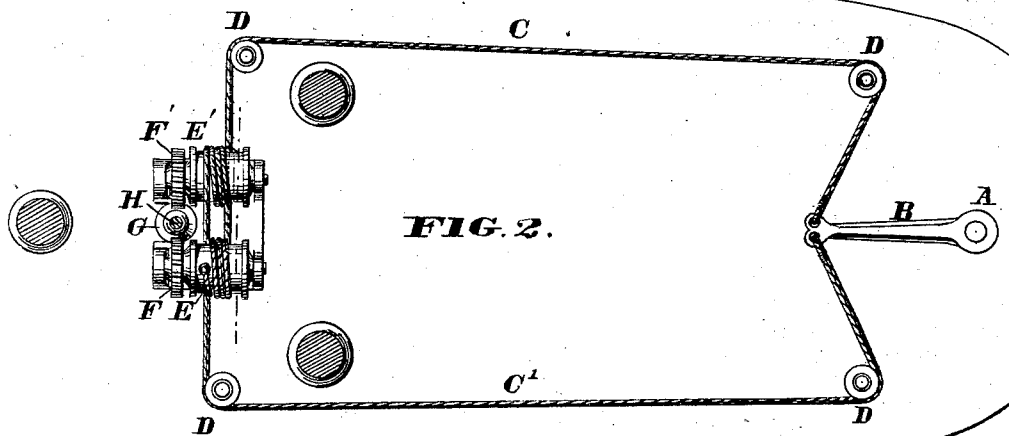
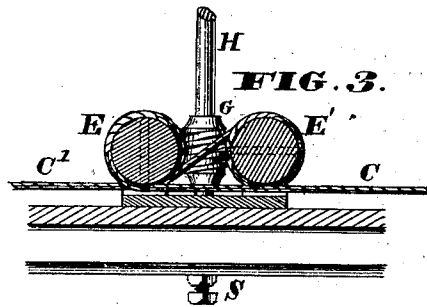
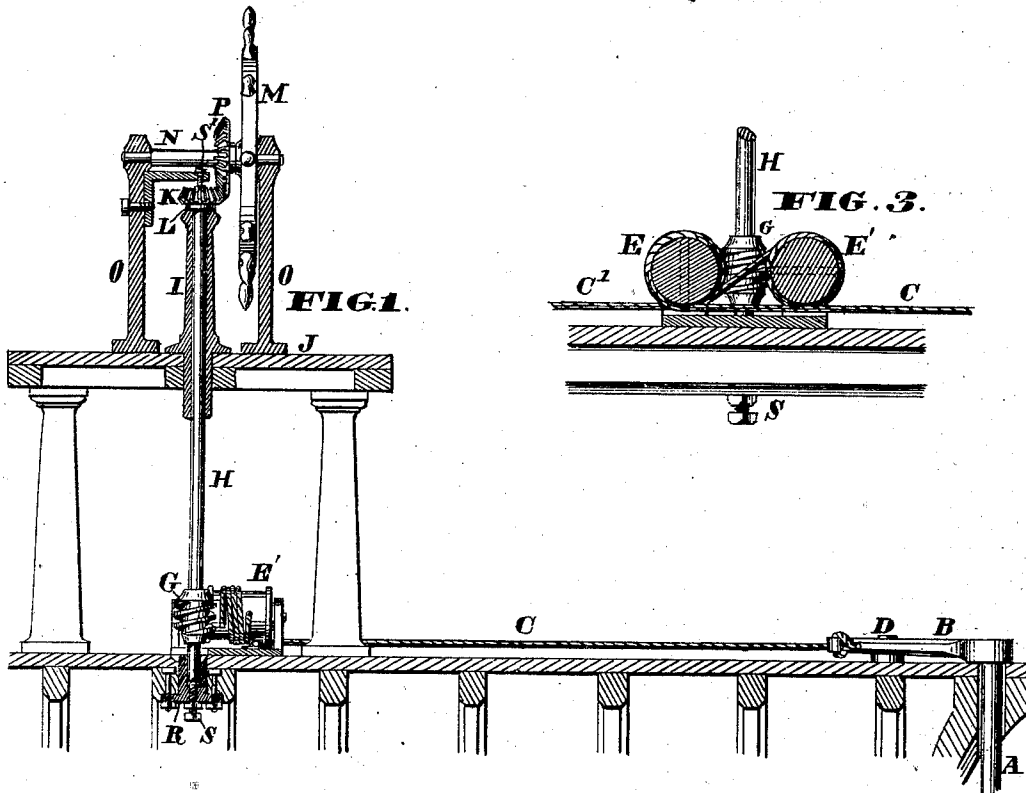


J. L. CATHCART.
Steering-Apparatus.

No. 155,926.

Patented Oct. 13, 1874.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES L. CATHCART, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN STEERING APPARATUS.

Specification forming part of Letters Patent No. **155,926**, dated October 13, 1874; application filed April 16, 1874.

To all whom it may concern:

Be it known that I, JAMES LEANDER CATHCART, of Washington, in the District of Columbia, have invented certain new and useful Improvement in Steering Apparatus, of which the following is a specification:

In my apparatus the horizontal shaft of the steering-wheel is connected by gearing with a vertical shaft carrying a screw or worm, which gears with a pair of drums on which the steering ropes or chains are coiled. The steering ropes or chains are led from the tiller through suitable sheaves, and so to the drums, the rope or chain from the starboard side being passed around the drum on the port side, and its standing part secured to said drum after a sufficient number of turns have been taken, and the rope or chain from the port side to the starboard drum, and there made fast in the same manner.

The vertical shaft is supported above and below by adjustable centers, to prevent end play and friction.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a steering apparatus illustrating my invention. Fig. 2 is a plan section thereof. Fig. 3 is a transverse section on a larger scale.

A is the rudder-post; B, the tiller; and C C', the customary wheel, chains, and rods, said chains being carried around sheaves D D D, and coiled around a pair of drums, E E', in the peculiar manner illustrated—that is to say, the rope or chain C, coming from the starboard side, passes under the drum E' and around the drum E a sufficient number of times, and its end is then made fast to the drum E. The rope or chain C', coming from the port side, is in like manner carried across the drum E and coiled around the drum E' a sufficient number of times, and its end made fast.

It will be apparent that by this mode of reeving or coiling the rope or chain the drums are made to work together effectively. The only part of the rope which is drawn against the surface of the other than its own drum always moves in conjunction with the surface of the drum which it touches.

It will also be seen that any strain applied to the chain to draw the tiller in either direction operates to draw the drums together and

more firmly into mesh with the gearing by which they are operated, and which I now proceed to describe.

F F' represents worm-wheels attached to drums E E', and G a worm meshing with the same, and mounted on a vertical shaft, H, and which turns in a pillar, I, rising from the floor J of the pilot-house. The shaft H is secured against vertical movement by a pinion, K, on its upper end, resting on top of the pillar I, and a collar, L, bearing upward against the bottom thereof. M is the customary hand-wheel, the shaft N of which is mounted in bearings in the stanchions O, and carries a bevel pinion, P, gearing with the similar pinion K on the shaft H. The lower end of the shaft H works in a step, R, containing an adjustable center, S, and a corresponding adjustable center, S', is provided at the upper end. These centers permit the taking up of the end play of the shaft, and effectually prevent any undue friction.

From the above description of the mode of applying the invention in connection with a pilot-house, the skilled constructor will readily be able to apply it to sailing vessels or vessels without pilot-houses, the only essential changes being the shortening of the vertical shaft, dispensing with the hollow column, placing the steering-wheel on the outside of its supporting stanchions, and preferably in front of the forward one, and placing the whole apparatus in the necessary proximity to the tiller.

Other modifications are described in my abandoned application filed the 5th day of March, 1874; all of these I regard as equivalents of the apparatus herein particularly described, and I therefore deem it needless to represent them by drawings.

The following is claimed as new:

In combination with any suitable operating mechanism, the ropes or chains C and C', and drums E E', the rope or chain from the starboard side crossing the starboard drum and coiled on the port drum, and vice versa, as explained.

JAMES L. CATHCART.

Witnesses:

OCTAVIUS KNIGHT,
WALTER ALLEN.