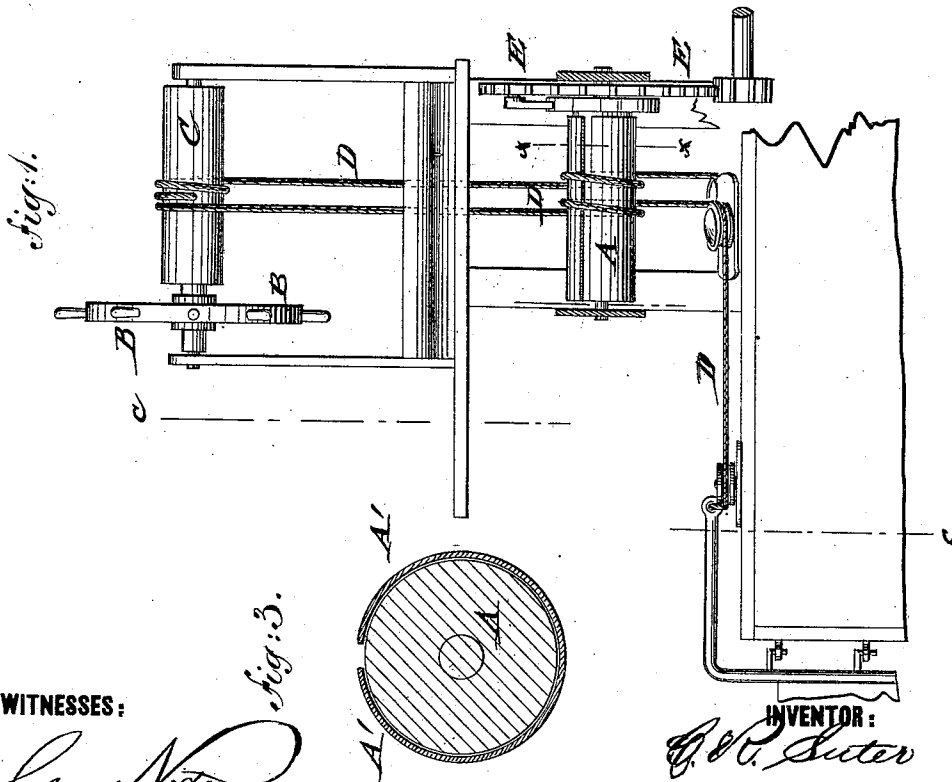
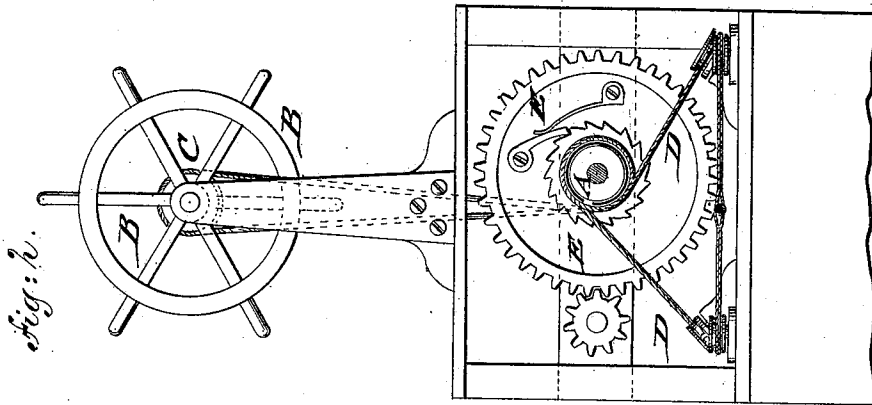


C. R. SUTER.
STEERING-APPARATUS.

No. 179,624.

Patented July 4, 1876.



WITNESSES:

Geo. N. Vata
John S. Coates

INVENTOR:

C. R. Suter

BY

M. M. H. 2
ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES R. SUTER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO HIMSELF AND ELLIOTT E. FURNEY, OF SAME PLACE.

IMPROVEMENT IN STEERING APPARATUS.

Specification forming part of Letters Patent No. **179,624**, dated July 4, 1876; application filed May 27, 1876.

To all whom it may concern:

Be it known that I, CHARLES R. SUTER, of St. Louis, in the county of St. Louis and State of Missouri, have invented a new and Improved Steering Apparatus, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation of my improved steering apparatus; Fig. 2, an end view of the same, partly in section, on line *c c*, Fig. 1, and Fig. 3 a detail vertical transverse section, on line *x x*, Fig. 1, of the rotating drum, with split sleeve.

Similar letters of reference indicate corresponding parts.

My invention relates to an improved steering apparatus for vessels that may be worked with great facility, and without requiring special instruction, the steering being readily accomplished, in connection with a suitable driving machinery, or without the same, by hand alone, as required.

The invention consists of one or two winding-drums, revolved by suitable power, around which the tiller-ropes are wound, when slack merely is taken up by the steering-wheel and barrel in steering. The power-drums are provided with ratchet wheel and pawl, to admit the use of the apparatus directly from the steering-wheel when the driving machinery is not in working order.

In the drawing, A represents one or more drums, that are arranged either below the steering-wheel B and barrel C, or at any other suitable part of the vessel. The drums A are rotated by appropriate machinery, of sufficient power to wind up the tiller-ropes D, and move the rudder at any desired speed.

The tiller-ropes are wound around the drum or drums A, and are then passed up to the barrel C of the steering-wheel, to which they are applied and attached in the usual manner. When no strain is exerted on the tiller-ropes they are always slack enough on the drums to allow them to turn freely within the coils or windings of the ropes. As soon as the steering-wheel is turned in either direction the slack of the corresponding tiller-rope is taken in, thereby compressing its coils upon the rotating drum until it revolves friction-tight

therewith, and is wound by the machinery, as required by the position of the rudder. As long as the steering-wheel is turned sufficiently fast to take up the slack of the tiller-rope as it comes off the winding-drum, the rope will be wound in, and the rudder will move. When the wheel is stopped, but held fast, the coils relax sufficiently to allow the drum to rotate without winding in the rope, but not sufficiently to let the rudder run back until the wheel is released entirely or turned backward, when, of course, the strain on the rope, which has been winding in, will be completely relaxed. If the wheel is then turned in the opposite direction, the first line will be slackened, and the other will be wound in, while the rudder will instantly move in the opposite direction. The entire manual operation consists, therefore, in taking up the slack of the tiller-rope, which is required to be wound in, and this work can be made as light as may be desirable by making more or less turns of the rope on the rotating drums.

For the purpose of preventing the chafing of the tiller-ropes by the drums when the latter are revolving freely within the coils of the ropes, a slit elastic sleeve, A', Fig. 3, may be interposed between the ropes and drum. This sleeve has to be of sufficient elasticity to spring clear of the drum, and remain stationary when the tension over the ropes is released, but capable of being clamped friction-tight to the drum, so as to revolve with it when the coils of the rope are tightened by the application of the tension required to wind them in.

In order that any accident to or stoppage of the driving machinery may not prevent the steering of the boat, the apparatus is arranged to admit the instant change from power-steering to the usual hand-steering by a ratchet wheel and pawl, E, applied to the shaft of the drums. When, therefore, the machinery is stopped, the steering can be done by hand, in the usual way, as the tension on the lines tightens the coils on the drums, as before, but as the latter revolve freely by the teeth of the ratchet-wheel clearing the pawl, the line is wound in by the steering-barrel. This arrangement is therefore entirely automatic, and requires

no adjustment whatever to pass from hand to power steering, or vice versa.

When one drum only is used, the tiller-ropes are wound on it in opposite directions, in order that either may be wound in without reversing the direction of rotation of the drum. When two drums are used, they may be driven in one or opposite direction, as may be most desirable, the lines being wound around them in the proper manner to accomplish the object desired.

The function of the steering-wheel and barrel is to give the tiller-ropes the requisite tension, to enable them to be wound up by the rotating drums to the extent desired. The real work of steering is done by the drums, the work of taking up the slack of the ropes and keeping up the requisite tension only devolving upon the helmsman, so as to facilitate it and make it as simple and easily understood as possible.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. A steering apparatus for vessels, consisting of the combination of the tiller-ropes with the barrel of the steering-wheel, and with one or more rotating drums, around which the tiller-ropes are coiled, so that the slack is taken up by the barrel of the steering-wheel, while the motion of the rudder is accomplished by the rotating drums, substantially as set forth.

2. The combination of the tiller-ropes with the barrel of the steering-wheels, and with one or more rotating drums, having ratchet wheel and pawl mechanism to allow the instant change from power to hand steering on the stoppage of the drum-driving machinery, substantially as and for the purpose set forth.

CHARLES R. SUTER.

Witnesses:

A. H. BLAISAM,
HENRY CLAGUE.