

(No Model.)

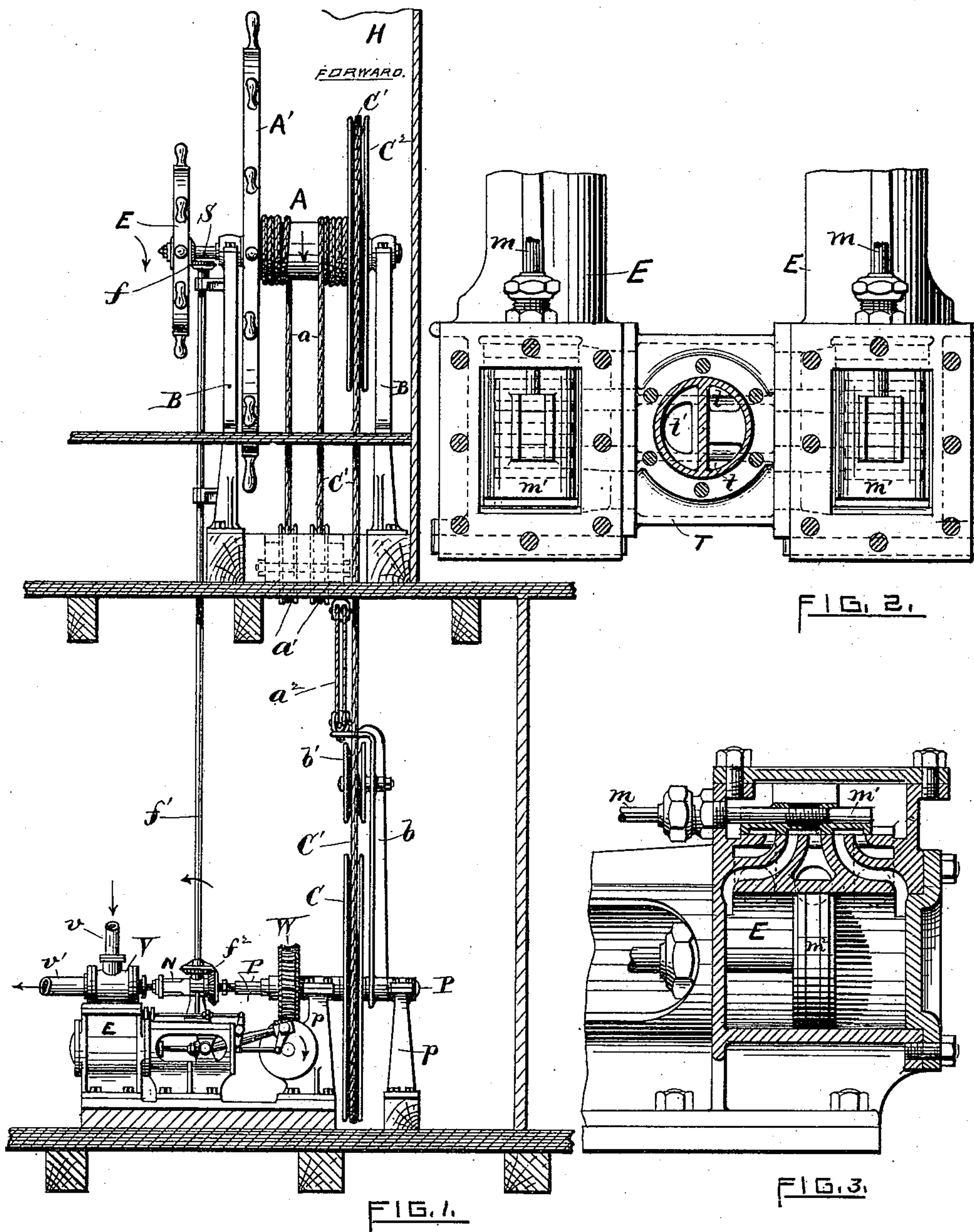
2 Sheets—Sheet 1.

J. P. MANTON.

STEAM STEERING APPARATUS.

No. 350,463.

Patented Oct. 5, 1886.



WITNESSES,

*Charles Hannigan.*  
*Joseph P. Manton, Jr.*

INVENTOR

*Joseph P. Manton.*  
*by Geo. H. Remington*  
*Att'y.*



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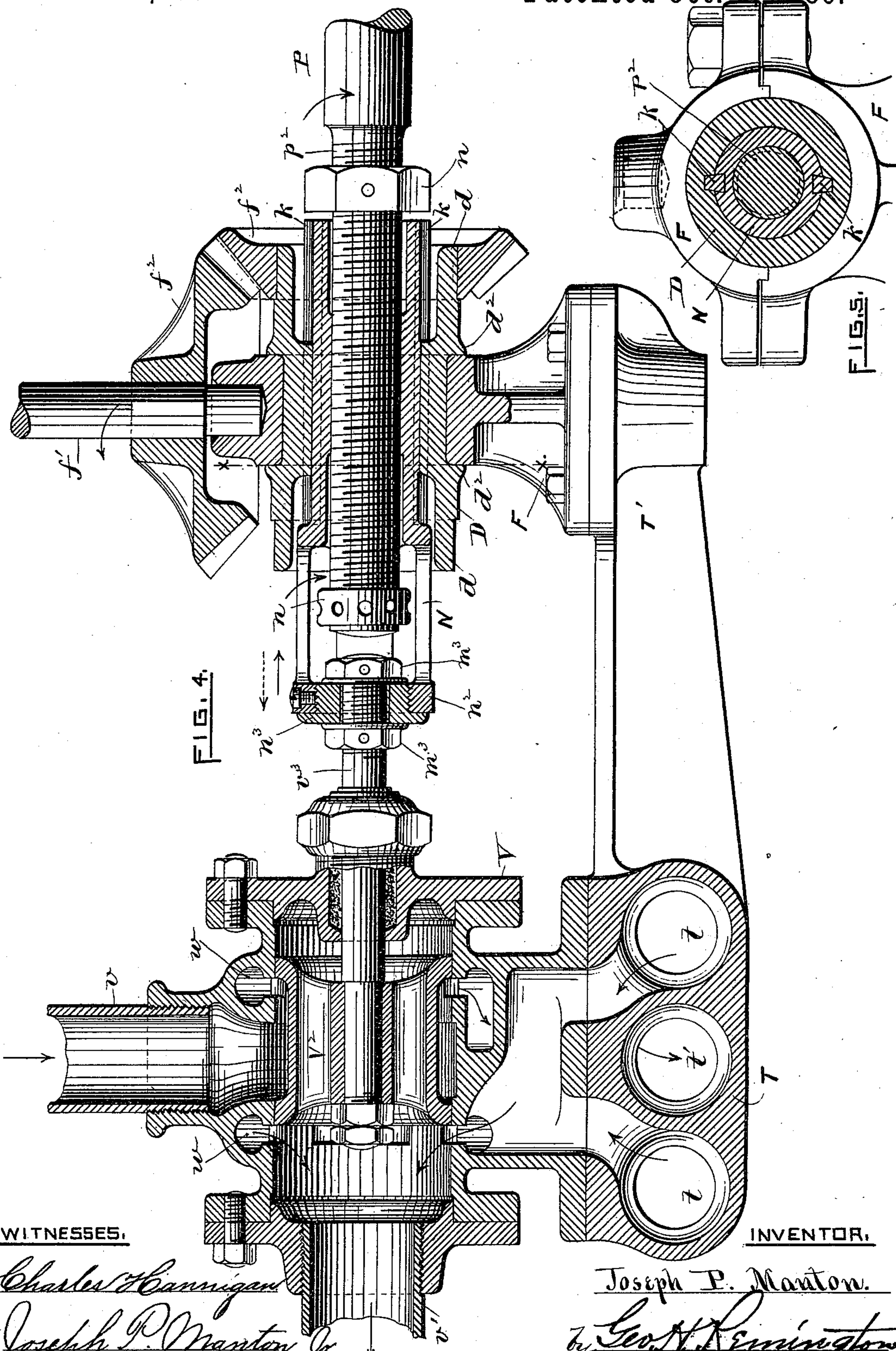
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INVENTOR,

Charles Hannigan  
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Joseph P. Marston.  
by Geo. H. Remington  
11/14.



# UNITED STATES PATENT OFFICE.

JOSEPH P. MANTON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO  
EDGARTON BYNNER, OF BROOKLYN, NEW YORK.

## STEAM STEERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 350,463, dated October 5, 1886.

Application filed December 21, 1885. Serial No. 186,292. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH P. MANTON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Steam Steering Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My present invention relates to steam steering apparatus; and it consists, essentially, in the novel construction and arrangement of the reversing-valve of the engines or motors, said invention being an improvement upon the steam steering mechanism patented to me by the United States under date of October 8, 1878, and numbered 208,833.

The object of the invention herewith is, primarily, to provide means for operating the reversing-valve, and also means for automatically closing the valve, thereby closing the steam-inlet passages to the engines.

In the two accompanying sheets of drawings, illustrating my invention, Figure 1, Sheet 1, represents a portion of a vessel in section, viewed "fore-and-aft," showing a side elevation of the steering mechanism complete as in use, the engines and driving-connections being located "between decks." Fig. 2 is an enlarged plan view showing the two steam-engine cylinders with the steam-chest covers removed, and also showing a sectional view of the lower portion of the reversing-valve casing. Fig. 3 is a vertical central sectional view through one of the cylinders. Fig. 4, Sheet 2, is a vertical central sectional view, enlarged, showing the reversing-valve connected to the mechanism which is adapted both to open and close the valve, and also showing a sectional view of the steam-connection which unites both engines, the valve being in the position to admit steam into the center chamber of said connection, and thus run the engines ahead; and Fig. 5 is a transverse sectional view taken on line *x x* of Fig. 4.

The following is a detailed description of the invention, including the manner of its operation.

A, again referring to the drawings, designates the barrel or drum of the steerer, said barrel being secured to a shaft, S, which is mounted in standards B, suitably arranged in the pilot-house H, and secured to the deck thereof, all as usual.

*a* indicates the steering ropes or chains, the same being wound around the barrel in opposite directions, and passed over sheaves *a'*, which lead the ropes to the rudder or tiller, also as usual.

A' is the hand-steering wheel secured to the shaft S, by means of which the vessel may be steered by manual power, when desired.

E E designate a pair of engines or motors located between decks, said engines each being connected to and operating a shaft having a worm mounted thereon, which engages a worm-wheel, W, secured in turn to a shaft, P, mounted in bearings *p*, as clearly shown.

C is a driving wheel or pulley secured to the latter shaft, from which a flexible connection, C', leads to a similar wheel, C'', secured to the drum-shaft S, for operating the same.

*b* indicates a loosely-mounted binder carrying an idler-pulley, *b'*, for the purpose of regulating the tension of the belt or driving-connection C'.

E<sup>2</sup>, now more particularly referring to my present improvements, designates a "trick-wheel," so called, loosely mounted on the shaft S, said wheel, by means of a pair of beveled-tooth wheels, *f*, being used to revolve the vertical shaft *f'*, which is suitably mounted and supported for the purpose of operating the reversing steam-valve V<sup>2</sup>, and thus, in connection with the mechanism about to be described, control the action of the engines E. The driving-shaft P is reduced somewhat in diameter at *p*<sup>2</sup>, Fig. 4, said portion being screw-threaded and provided with stops or nuts *n n*, as clearly shown.

N indicates an annular nut mounted in a sleeve, D, which latter in turn is journaled in a bearing, F, the cap of said bearing serving as a step to support the vertical shaft *f'*. The nut N is tapped to receive the screw *p*<sup>2</sup>, before described, the nut being provided with



splines or feathers  $k$ , which are let into grooves formed in the sleeve D. By means of this arrangement the nut revolves in unison with the sleeve. At the same time, however, the nut is adapted to be moved endwise irrespective of said sleeve movement, flanges  $d^2$  serving to retain the latter in position in the bearing F, as clearly shown in Fig. 4. The inner end of the annular nut is provided with a head,  $n^3$ , adjustably secured thereto, said head having the outer end of the valve-stem  $v^3$  loosely mounted therein, the same being retained in position and adapted to travel endwise (but not to revolve) with the nut N by means of the washers and retaining-nuts  $m^3$ , as shown.

V indicates the shell or chambered casing provided with the double set of annular ports  $w-w$ , said ports being so arranged, in connection with the hollow valve  $V^2$ , secured to the stem  $v^3$ , that while one of the said ports is admitting live steam into the engines by means of the passage  $t'$  the other port receives the exhaust from the engines by means of the passages  $t$ , (see Fig. 4,) or vice versa.

$f^2 f^2$  indicate a pair of bevel gear-wheels, one of which is secured to the vertical shaft  $f'$ , near its lower end, the other gear being secured to one end of the bushing D, before described, both ends of said bushing being formed alike.

It is practically found sometimes on ship-board that the arrangement of the tiller ropes and blocks is such that in the employment of the trick-wheel  $E^2$  would produce a contrary effect upon the rudder than is desired. This defect is adapted to be readily overcome by simply removing the gear-wheel  $f^2$  from the bushing and securing it at the opposite end thereof, thereby reversing the relative rotary movements.

The operation may be described as follows: The trick-wheel  $E^2$  is first quickly turned—say four revolutions—in the arrow-direction, to fully open the valve  $V^2$ , as in Fig. 4. Now, as the screw  $p^2$  and the grooved bushing D are prevented from moving endwise, it is obvious that the nut N, by means of said movement of the trick-wheel, will be revolved, and thus be screwed along on the screw  $p^2$ , the valve  $V^2$ , attached to the nut, being correspondingly moved along to open the ports  $w$  as just stated. Steam is thereby admitted into the engines E, by means of which the latter, together with the driving-wheels C C<sup>2</sup> and drum A, are revolved in the direction indicated by the full-line arrows. This action of the engines causes the shaft P to make, say, four revolutions also, (the trick-wheel being held stationary meanwhile by the steersman,) thereby forcing the nut N and the valve back in the opposite direction and closing the valve, the latter then being in its normal position and covering both ports  $w w$ , thus automatically shutting off steam from the engines.

It is evident that the drum A is adapted to

be revolved in the opposite direction by simply reversing the movement of the trick-wheel, thereby shifting the exhaust-passages of the engines—that is to say, the valve  $V^2$  will then be moved toward the left sufficiently to admit steam into the passages  $t t$ , while the exhaust steam from the engines passes out through the opening  $t'$ , and also through the valve  $V^2$ , into the exhaust-pipe  $v'$ . This method of reversing the exhaust-passages is, however, more particularly pointed out in my United States Patent No. 208,833, hereinbefore referred to.

It is obvious that the relative velocities of the wheel  $E^2$  and the reversing-valve  $V^2$  may be varied as desired without departing from the spirit of the invention—as, for example, one revolution of the said wheel may be made to fully open the valve, in lieu of the several turns required for the purpose, as previously described. Therefore I do not limit myself to the exact construction and arrangement of the parts shown in the drawings. It is further evident that in the lighter class of vessels—such as steam-yachts, &c.—wherein the space between decks forward is limited to a narrow or contracted compartment, I may substitute a train of gears to transmit power from the engines to the steering-drum A, in lieu of the pulleys C C<sup>2</sup> and flexible connection C' shown.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a hand and steam steering-gear, of the screw-threaded driving-shaft P, a nut mounted on said screw having the reversing-valve directly connected therewith, a suitably-mounted bushing adapted to revolve said nut, and means, substantially as shown and described, for operating the bushing, as set forth.

2. The steering-drum A, provided with a hand-wheel, A', and wheel C<sup>2</sup>, bearing support- ing the drum and shaft, one or more engines or motors, E, screw-threaded driving-shaft P, actuated by means of said engines, gear-wheel W, and score-wheel C, mounted on the driving-shaft, in combination with the reversing-valve  $V^2$ , trick-wheel  $E^2$ , and means, substantially as shown and described, for operating said valve, the whole arranged whereby a band or flexible connection, C', is adapted to transmit power from the engines to the steering-drum, as and for the purpose set forth.

3. In a hand and steam steering apparatus, the combination, with the screw-threaded driving-shaft and nut N, mounted thereon, having the reversing-valve  $V^2$  connected directly therewith, of the mounted bushing D, adapted to operate said nut by means of a trick-wheel,  $E^2$ , substantially as shown and hereinbefore set forth.

4. In a hand and steam steering apparatus, the combination, with the drum A, engines E, and shaft P, arranged to drive said drum, of



5 a hollow tie, T, connecting the engines, a reversing-valve, V<sup>2</sup>, mounted in a casing secured to said tie, a nut, N, connected with said valve, adapted to be moved endwise by means of the shaft P, and mechanism, substantially as shown and described, in connection with said nut, by means of which the steersman is enabled to operate the valve V<sup>2</sup> independently of the rotation of the shaft P, as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOSEPH P. MANTON.

Witnesses:

GEO. H. REMINGTON,  
CHARLES HANNIGAN.