

(No Model.)

2 Sheets—Sheet 1.

J. P. MANTON.

STEERING MACHINERY FOR FERRY BOATS.

No. 350,465.

Patented Oct. 5, 1886.

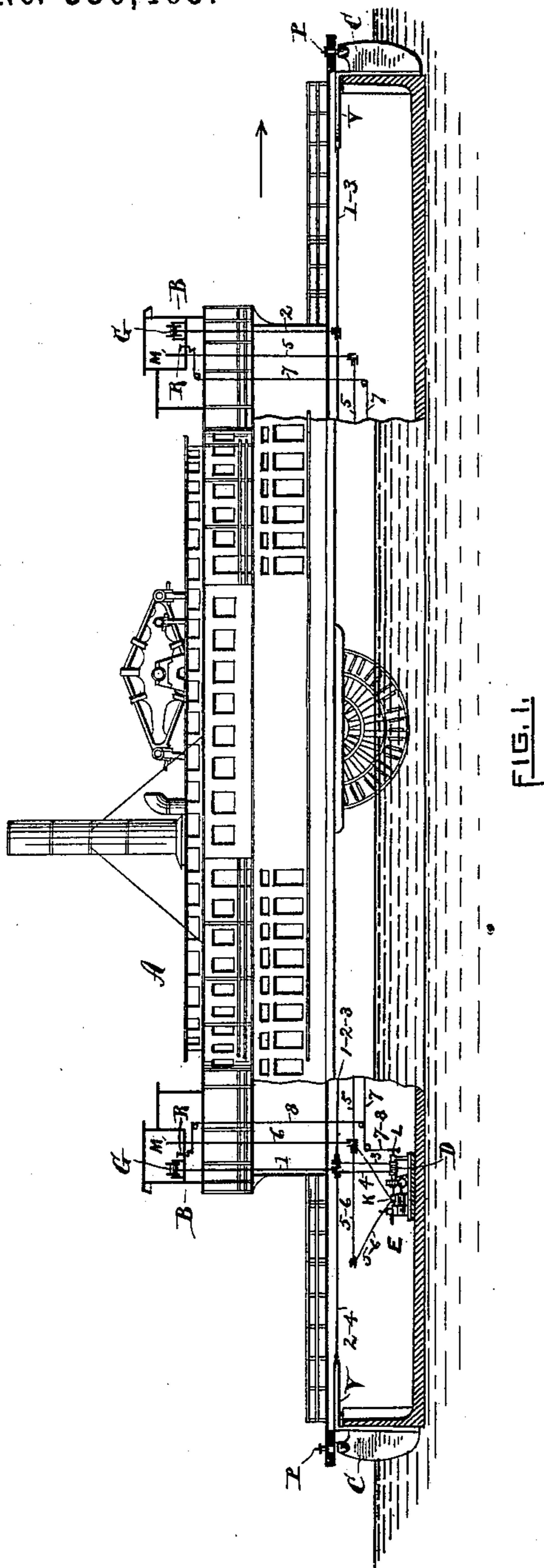


FIG. 1.

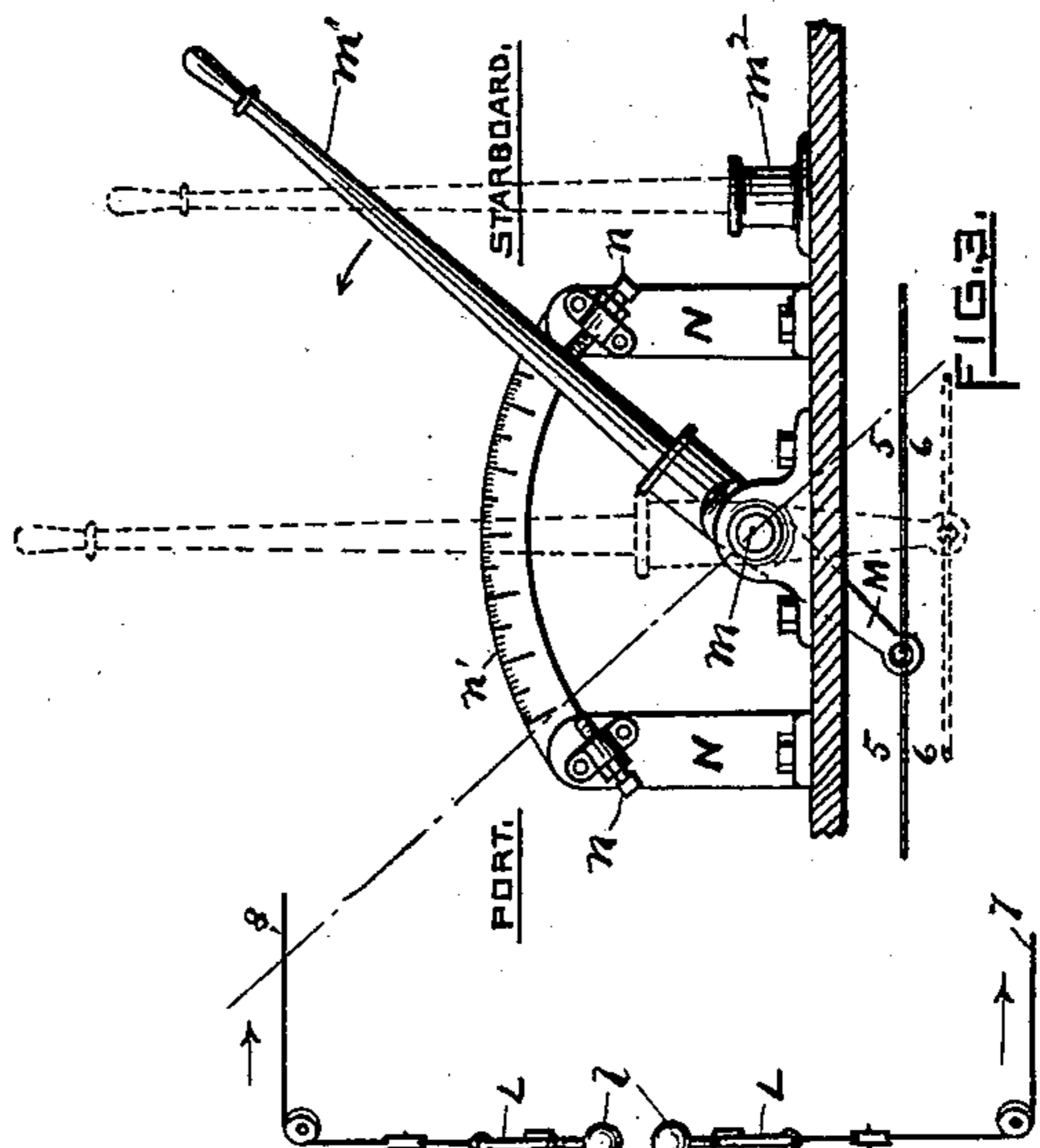


FIG. 2.

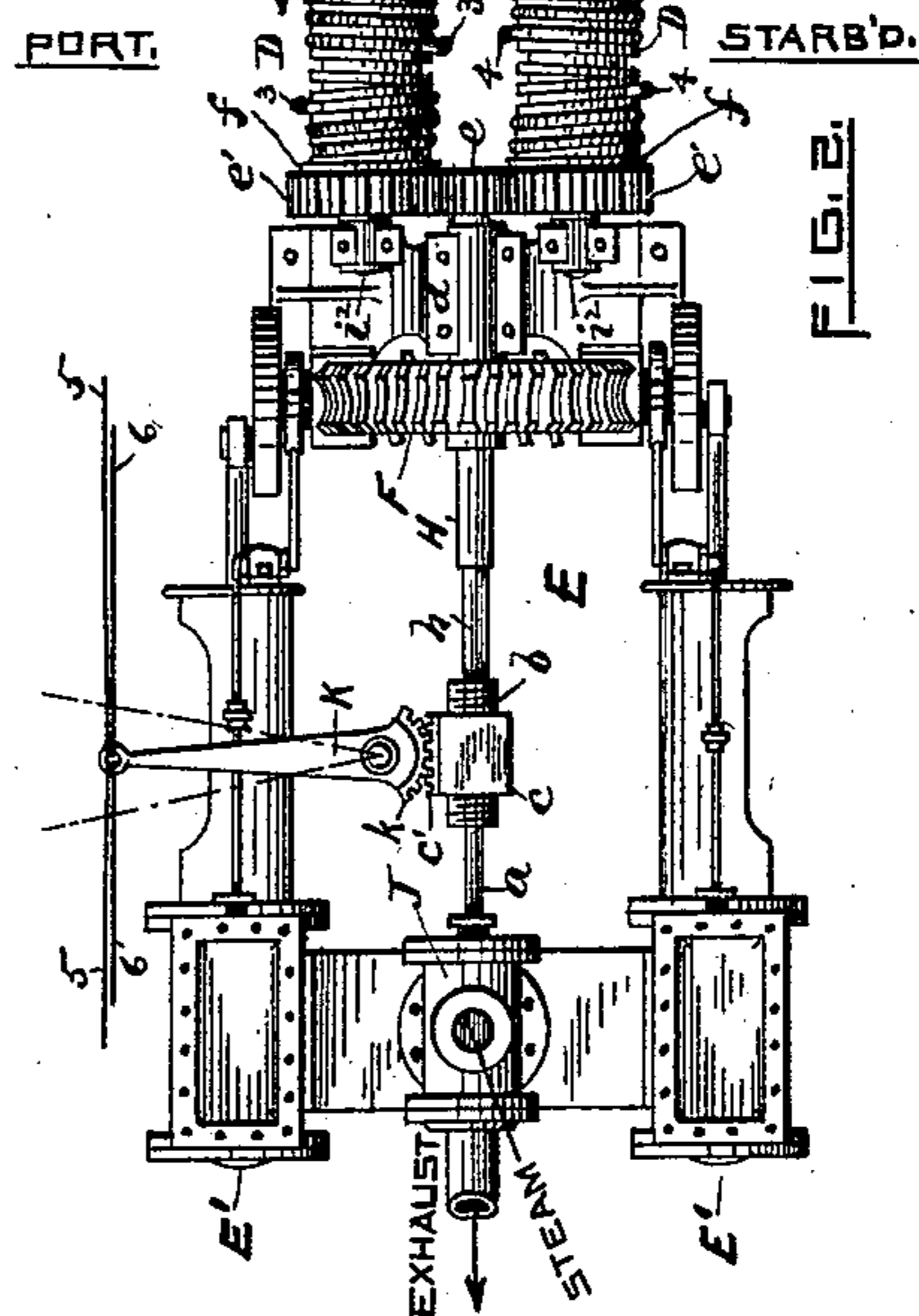


FIG. 3.

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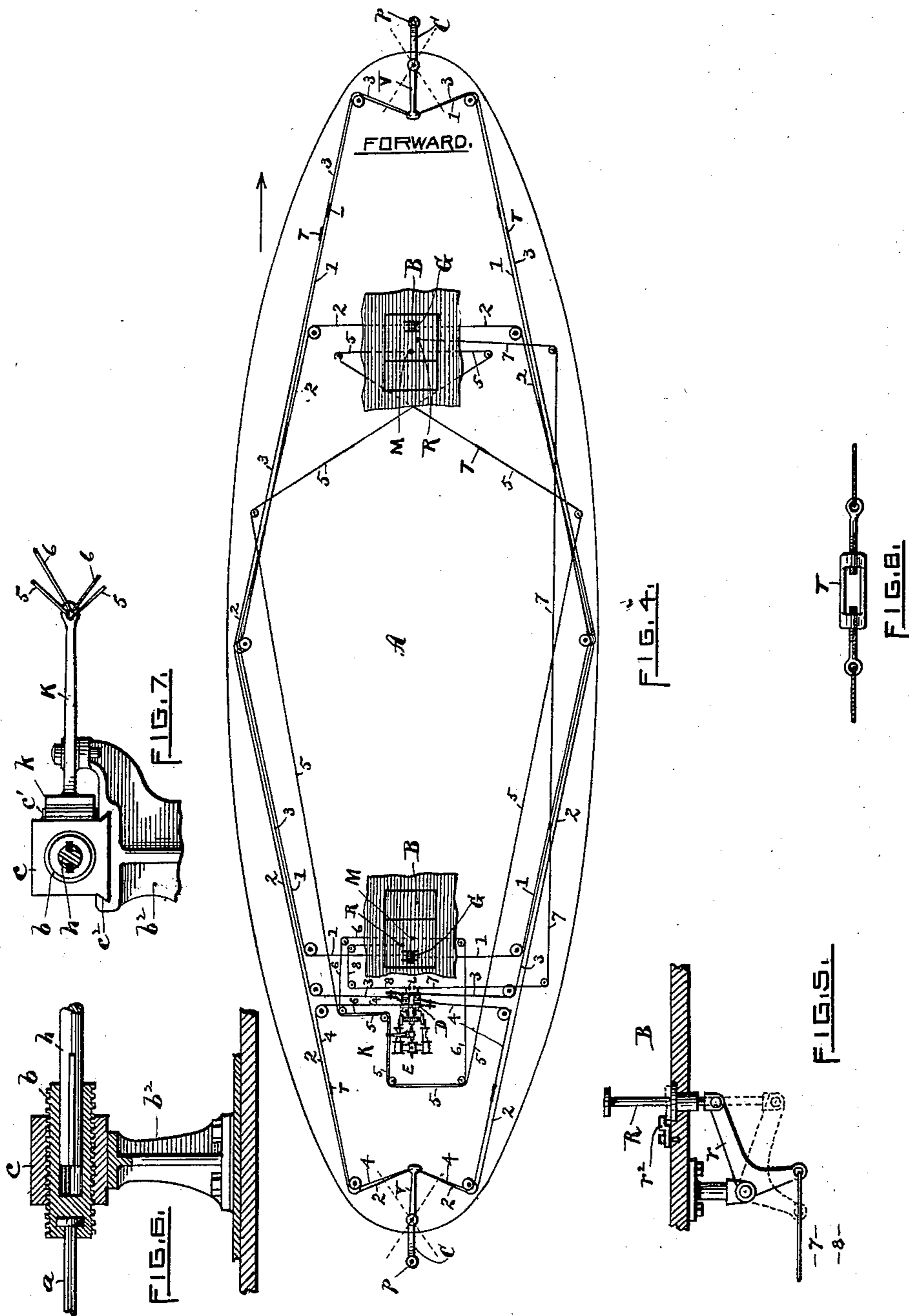
2 Sheets—Sheet 2.

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Charles Harrigan.

INVENTOR.

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UNITED STATES PATENT OFFICE.

JOSEPH P. MANTON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO
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STEERING MACHINERY FOR FERRY-BOATS.

SPECIFICATION forming part of Letters Patent No. 350,465, dated October 5, 1886.

Application filed February 23, 1886. Serial No. 192,835. (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 Steering-Machinery for Ferry-Boats; 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 improved mechanism for steering ferry-boats or double-ended vessels having a rudder at each end thereof.

My invention consists, essentially, in the novel construction and arrangement of the steam steering mechanism, the same comprising a motor or engine having two loosely-mounted steering-drums directly connected therewith, which in turn connect with the rudders, mechanism for locking said drums to the shafts, and mechanism for operating the reversing-valve of the engine.

The invention further consists in the novel arrangement in the pilot-houses of the valve-operating lever, whereby the movement of said lever coincides with and indicates the position of the rudder, all as will be more fully hereinafter set forth and claimed.

The object of my invention is to so construct, arrange, and connect a steering engine that it will operate either rudder at will, as desired.

The arrangement is further adapted to be used in conjunction with hand-steering drums located in the pilot-houses.

By means of the invention a steersman in the forward pilot-house is enabled to readily control the movement of the after rudder, the lever which actuates the reversing-valve at the same time serving to indicate the rudder's position, said mechanism being an improvement upon that shown and claimed in my United States Patent No. 317,817, of May 12, 1885.

In the accompanying two sheets of drawings, illustrating my invention, Figure 1 represents a side view of a ferry-boat in partial

section, as provided with my improved steering mechanism. Fig. 2 is a plan view, enlarged, of the double-steering engine, as provided with two loosely-mounted drums, each connecting with a rudder, and also showing mechanism for operating the reversing-valve, said device being connected to a lever or wheel mounted in each pilot-house. Each drum is frictionally connected to a driving-gear by means of a screw and lever, which in turn connects with and is operated by a treadle-lever mounted in the respective pilot-houses. Fig. 3 is a detached view showing the reversing-valve lever as mounted in the pilot-house, the same being provided with means to adjust and limit the angular movement of the lever, said movement corresponding to the travel or vibration of the rudder. One of said levers is mounted in each pilot-house and connected with the lever at the engine, forming a part of the reversing mechanism. Fig. 4, Sheet 2, is a plan view showing the general arrangement of the engine, rudders, drums, and connections, the deck being removed, but showing a portion of each pilot-house. Fig. 5 is an enlarged side view through the floor of a pilot-house, showing the manner of operating the friction-clutch of the engine-drums. Fig. 6 is a vertical central sectional view showing the construction of the mechanism for operating the reversing-valve. Fig. 7 is an end view of the same, and Fig. 8 represents a turn-buckle.

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

A, again referring to the drawings, designates the ferry-boat as a whole, the same being furnished with two pilot-houses, B, and the two rudders C, arranged as common to vessels of this class.

E indicates the steering engine or motor as a whole, the same consisting of the engines E', which operate a crank-shaft upon which a screw-worm is secured, the latter engaging a worm-wheel, F, secured to a shaft, H, the latter being extended toward the cylinders, and provided with a threaded sleeve or bushing, b, which is adapted to longitudinally move a reversing-valve suitably mounted in the casing J, for the purpose of admitting steam into the engines and exhausting it therefrom. I

make no claim, however, to this construction of the valve, &c., as the same forms the subject of another application for Letters Patent filed by me in the United States Patent Office, Serial No. 186,292. The outer end of said shaft H, which projects beyond the bearing *d*, is provided with a gear-wheel, *e*, which in turn intergears with the gear *e'*, secured to each drum-shaft *i*², arranged on opposite sides of the machine, as clearly shown in Fig. 2. Upon each of said shafts *i*² is a loosely-mounted drum, D, having its inner end, *f*, made slightly conical, for the purpose of frictionally engaging the said driving-gear *e'*, which is provided with a circular recess forming the counterpart of the cone *f*. The port drum D operates the wire rope 3, which connects with the tiller of the forward rudder, and the starboard drum, by means of the rope 4, serves a like purpose for the after rudder.

i i, Fig. 2, indicate screw-threaded rods or bolts, each mounted in a stationary nut, *i'*, and having a weighted lever, L, secured to each rod. Wires 7 and 8, leading from the forward and after pilot-houses, connect with said weighted levers and operate the starboard and port drums, respectively.

Each pilot-house is provided with a device for operating its respective lever L, as represented in Fig. 5, the same consisting of a pivoted bell-crank lever, *r*, supported beneath the deck of the pilot-house, and having the push-rod R, extending from the lever *r* up through said deck, the other arm of the lever having the rope 7 or 8 leading to the lever L connected therewith, the upper end of the rod R being provided with an enlargement, as shown. While in use, when steering by the employment of steam-power, the rod is depressed and retained in position by means of the catch *r*², thereby locking the drum D to the gear *e'* through the medium of its lever L, &c.

The reversing-valve mechanism comprises a stand, *b*², in which a tapped block, *c*, is fitted to slide freely. One side of the block is provided with teeth *c'*, Figs. 2 and 7, thus serving as a rack into which the toothed sector *k* of the lever K engages. The end *h* of the shaft H is provided with keys, which serve to unite it with the screw-threaded bushing *b*, the latter being screwed into the block *c*, before described.

a is the valve-rod. It is obvious that any angular movement of the lever K will cause the rod and bushing to move longitudinally independent of the shaft's (H) rotation, thereby actuating the reversing-valve in the casing J as desired. It is also obvious that if the lever K be held in position, the rotary movement of the shaft will screw the bushing along the nut *c*, thereby serving to shut off steam from the engines E'.

M indicates an arm or lever pivoted in each pilot-house B to a stand secured to the floor, *m'* being the removable operating-handle.

N is a standard provided with the adjusting-stops *n* and the graduated arc *n'*, all as clearly shown in Fig. 3. The length of this arc corresponds to the angular movement of the rudders.

Each respective lever M is connected by means of suitably-supported wire ropes with the lever K, before described—that is, the wire rope 5, leading from the forward pilot-house lever M, connects both sides of the lever K, and the wire rope 6, leading from the after pilot-house, is similarly connected to said lever K.

The number of revolutions of a drum required to carry the rudder to one extreme or the other from its central or fore-and-aft position, corresponds to the dotted and full line position of the lever *m'* shown in Fig. 3, the same in turn corresponding to the extreme position right or left from the central position of the lever K, Fig. 2, and causing a corresponding movement of the reversing-valve—that is to say, by moving the lever K toward the left will admit steam into the cylinders E' and run the engines in one direction, and by moving it toward the right steam is admitted into the cylinders to revolve the engines in the reverse direction.

The several wire ropes are provided with turn-buckles or "take-ups" T, for obvious purposes, as usual.

G indicates a hand steering-drum mounted in each pilot-house and connected to the tillers *v*, as usual, the wire rope 2 leading from the forward drum, G, to the after rudder, and the wire-rope 1 leading from the after drum to the forward rudder, as indicated in Figs. 1 and 4. This hand-steering arrangement in no wise interferes with the steam-steering apparatus.

The general arrangement of the leading wire ropes shown in Fig. 4 may be materially modified practically in order to economize room, &c., said ropes in the drawings being separated for the purpose of permitting them to be the more readily traced out.

Desiring to run the boat ahead, as indicated by the arrow, the operation in steering by steam would be substantially as follows: The pin P, however, is first inserted in the socket *p* of the forward rudder, and the locking-pin P of the after rudder withdrawn from its corresponding socket, as shown in Fig. 1. Now, to move the rudder—say from the central to the "hard-a-starboard" position—the steersman first depresses the rod R by means of his foot, thereby frictionally locking the starboard-drum D to the driving-gear *e'*. The steersman next grasps the handle *m'* of the lever M and forces it over to the extreme starboard position, (see Fig. 3,) which movement, by means of the wire-rope connection 5, forces the reversing-valve lever K to the extreme right position, and admits steam into the engines E', thereby causing them to revolve the drum D in the proper direction, and by means of the tiller-rope 4 moving the rudder the distance desired. At the same time

the shaft H in revolving acts to automatically close the valve through the medium of the mechanism *b c*, &c., so that the lever K stands in its central or normal position, as shown, 5 at the time the rudder arrives at its extreme starboard position. A reversal of the foregoing movements returns the rudder to the fore-and-aft position again. By moving the reversing-lever *m'* to "port," steam then enters 10 the cylinders E' from the opposite direction, and causes the drum D to revolve in a reverse direction, and thus by means of the other rope, 4, carries the rudder to the left or port. The angular movement of the lever *m'* corresponds 15 to the angular movement of the rudder, said lever thus forming an indication of the rudder's position.

In steering by hand the pressure is first removed from the rod R, which thereby releases 20 the loosely-mounted drum D from the driving-wheel *e'*, the steersman then manipulating the steering-wheels of the drum G, as usual, 2 being the steering-ropes leading therefrom to the after-tiller for the purpose, as shown.

25 When the boat is running "stern first," the manner of steering by steam is substantially the same as when the boat is running in the other direction, before described, except that the rod R of the after pilot-house is connected 30 with the friction-clutch by means of the wire rope 8, and the reversing-lever M is connected with the lever K by a wire rope, 6, 3 3 being the tiller-ropes leading from the port drum D to the forward rudder, while ropes 1 lead from 35 the pilot-house drum G to the said rudder.

It is obvious that a suitably-mounted trick-wheel may be substituted for the reversing-lever M; also many minor changes or modifications may be made in the construction and 40 arrangement of the engines and their connections without departing from the spirit of the invention.

I do not claim, broadly, as my invention the device herein shown for frictionally locking 45 a loosely-mounted steering-drum to a driving-gear; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In a ferry-boat or double-ended vessel 50 having a rudder at each end thereof, a motor or engine, two suitably-mounted drum shafts, a gear-wheel secured to each shaft, a steering-drum, D, loosely mounted on each shaft, located at the rear of and actuated by said motor, a friction-head, lever, and connections for 35 frictionally locking said drums and gear-wheels together, and mechanism, consisting of a flexible connection, a lever, a screw-threaded bushing mounted on a driven shaft, and a nut actuated by said lever and shaft for opening 60 and closing the reversing-valve of the motor or engine, in combination with two pilot-houses, each having a suitably-mounted hand lever or wheel adapted to operate the said reversing-valve lever, and an arm and flexible 65 connections for actuating the said locking-lever of the corresponding steering-drum, D,

the whole constructed and arranged whereby the steersman is enabled to control the movement of the rudder, substantially as shown, 70 and hereinbefore set forth.

2. In a ferry-boat or double ended vessel having a rudder and a suitably mounted and connected hand-steering drum at each end thereof, the combination therewith of the 75 power-driving mechanism herein described, consisting, essentially, of the motor E, having loosely-mounted steering-drums connected to each rudder, means, substantially as shown, for locking the drums D to the driving-wheels 80 *e'*, a lever, K, &c., for operating the reversing-valve of the engines, and levers M R, mounted in each pilot-house, connected, respectively, to said reversing-valve lever K, and the drums and locking device for operating the same, the 85 whole constructed and arranged whereby the steersman is enabled to control the movement of the rudder from each pilot-house, as desired.

3. The combination, with the reversing-valve 90 mechanism of a steam steering-engine adapted to independently operate the two rudders of a ferry-boat, of a bar or lever mounted in each pilot-house, a frame in which the lever is pivoted, two stops for limiting the angular move- 95 ment of the free end of the lever, and ropes or flexible connections secured to the other arm of the lever, and the reversing-valve mechanism, substantially as shown, and for the purpose hereinbefore set forth. 100

4. The combination, with a hand steering-drum, G, mounted in each pilot-house of a ferry-boat, rudders CC, and ropes 1 2, connecting said drums and rudders, of the motor or engine E, two loosely-mounted steering-drums, 105 D D, actuated by said motor, wire ropes 3 4, leading from said drums D to the respective rudders, mechanism, substantially as shown and described, for locking and unlocking the drums D to and from the driving-gears *e'*, connections 7 8, for actuating said mechanism, a 110 lever or rod, R, mounted in each pilot-house for operating the connections 7 8, a valve-reversing mechanism for the engines, provided with the lever K, a lever or trick-wheel, M, 115 suitably mounted in each pilot-house, and wire ropes 5 6, connecting the respective levers M M with the lever K, the whole constructed and arranged substantially as shown, and for the purpose hereinbefore set forth. 120

5. In a ferry-boat provided with two rudders, CC, pilot-houses B B, and hand steering-drums G G, the combination, with the engines or motors E', means for controlling the same, and the two suitably-mounted gears *e'*, driven by said engines, of two loosely-mounted steering-drums, 125 D, means for locking said drums to the gears *e'*, and steering-ropes 3 4, connecting the drums D to the respective rudders, constructed and arranged substantially as shown and set forth. 130

6. The combination, with a steering-engine, the reversing-valve, and lever for actuating said valve, of the lever M, frame N, in which the latter lever is pivoted, stops *n n*, mounted

in said frame for limiting the vibratory movement of the lever M, and wire ropes connecting the lower end of the lever M and the said valve-lever, substantially as shown, and here-
5 in before described.

7. The combination, with the frame N, stops
n n, adjustably mounted in said frame, and graduated arc n', of the lever M, pivoted to the frame, and ropes connecting the short arm of
10 the lever and the reversing-valve lever of a

steam steering-engine, all constructed and arranged substantially as shown, and for the purpose set forth.

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

JOSEPH P. MANTON.

Witnesses:

GEO. H. REMINGTON,

JOHN T. HENTHORN.