

No. 639,939.

Patented Dec. 26, 1899.

R. RICHARDSON.
STEERING AND WARPING GEAR.

(Application filed Nov. 3, 1898.)

(No Model.)

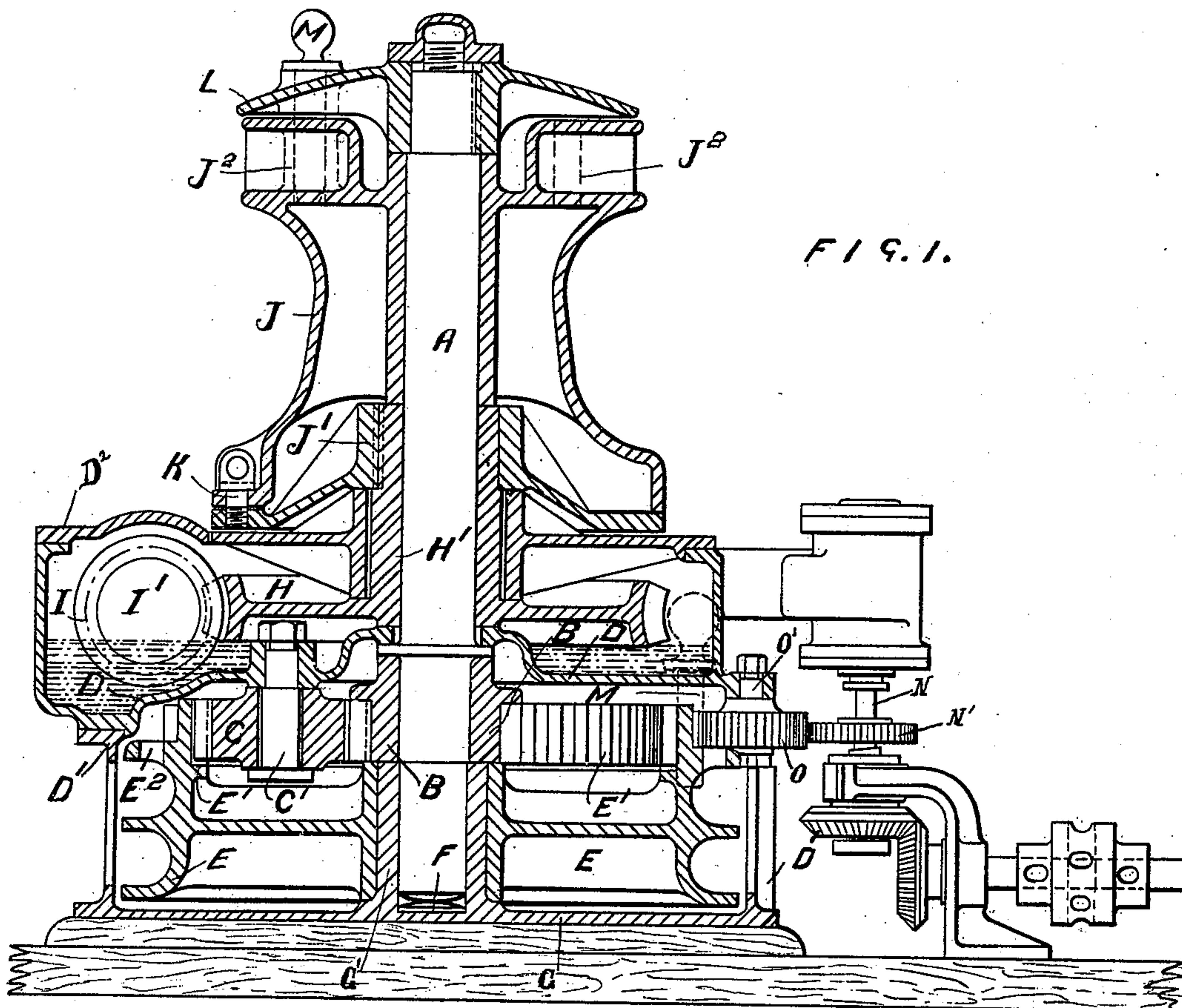


FIG. 1.

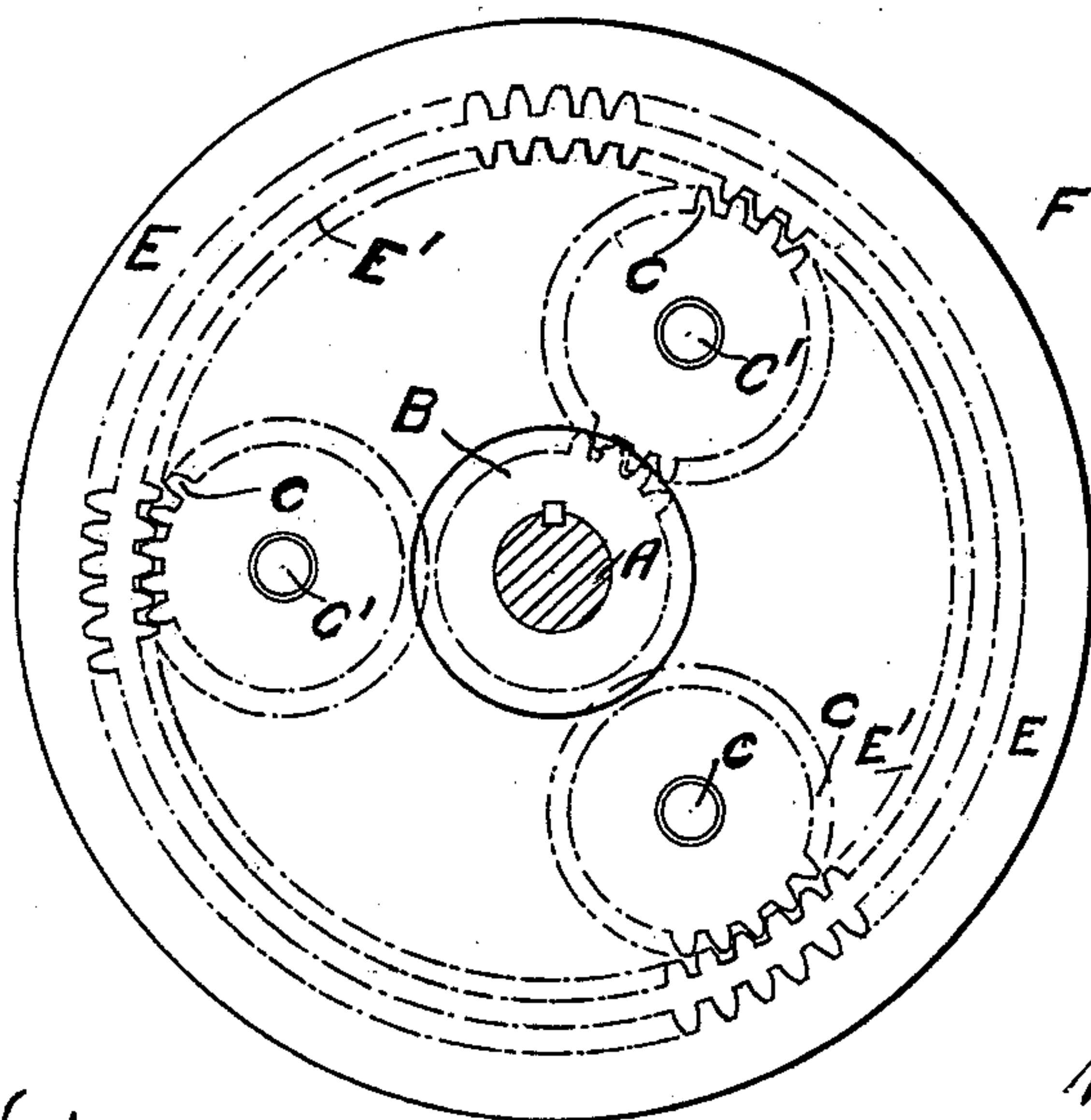


FIG. 2.

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UNITED STATES PATENT OFFICE.

ROBERT RICHARDSON, OF GLASGOW, SCOTLAND, ASSIGNOR TO GEORGE ALEXANDER MILL, OF SAME PLACE.

STEERING AND WARPING GEAR.

SPECIFICATION forming part of Letters Patent No. 639,939, dated December 26, 1899.

Application filed November 3, 1898. Serial No. 695,362. (No model.)

To all whom it may concern:

Be it known that I, ROBERT RICHARDSON, engineer, residing at 16 Jamieson street, Govanhill, in the city of Glasgow, Scotland, have
5 invented certain new and useful Improvements in Steering and Warping Gear, of which the following is a specification.

This invention relates to steering and warping gear; and it has for its object the better
10 construction of some of the parts, while readily permitting of steering or warping by steam or by hand power.

The invention is illustrated by the accompanying drawings, Figure 1 being a vertical
15 section of the improved steering and warping gear, and Fig. 2 a diagrammatic plan of a portion of the same.

In carrying out the invention I key upon the lower end of the usual vertical driving-spindle A a toothed wheel B and gear said
20 wheel to three or any convenient number of toothed wheels C, carried upon studs C' in the separate plate-cover D of the chain-drum casing D'. These wheels C, which in turn
25 gear with the internal teeth E' on the chain-drum or gypsy-wheel E, are driven by the toothed wheel B on the vertical spindle A, which spindle receives its motion from connections hereinafter described. I form a foot-
30 step bearing F for the lower end of the shaft which drives the chain-drum in a boss G' on the bed-plate G, said boss G' forming the stud upon which the boss of the chain-drum E turns. Above the toothed wheel B on the
35 lower end of the vertical shaft A and on a sleeve H', turning freely thereon, I form or secure the usual worm-wheel H, which gears with the worm I on the power-shaft I'. This sleeve H' is keyed to the boss J' of the lower
40 portion of the capstan J and is centered in the top cover D² of the casing D', the capstan J being made in two parts capable of separate movement, but normally secured together by a bolt K, the vertical shaft A being
45 carried up to near the upper face of the capstan. On the upper end of the vertical shaft a disk L is secured, through a hole in which a bolt M is passed to a like hole J² in the capstan J when it is desired to carry the
50 capstan J around with the vertical shaft A.

The steering-gear is driven by a pair of horizontal steam reversing-engines of common type used in steering-gear, the engines preferably being fore and aft, one to port and one to starboard.

When it is desired to steer by steam-power, the bolt K, engaging both portions of the capstan J, and the bolt M, engaging the capstan and the disk L on the upper end of the vertical shaft A, are left in position, and the
60 power for turning the chain-drum E is thus transmitted through the worm-wheel I and the capstan J to the vertical shaft A.

When it is desired to warp by steam-power, the pin M, engaging the capstan J and the
65 disk L on the vertical shaft A, is withdrawn, the pin M being transferred to a hole in the plate-cover D of the chain-drum casing D', where it engages with one of a series of holes E² in the chain-drum E to prevent jerking of
70 drum E, and the capstan J alone is turned by means of the worm-wheel H, whose sleeve H' is keyed to the boss J' of the capstan J. When warping by hand, both pins are withdrawn.

Should it be desirable at any time to steer
75 by hand, the bolt engaging the capstan J and the disk L on the vertical shaft A is left in position; but the bolt K, securing the lower and upper portions of the capstan J together, is withdrawn, the power for turning the chain-
80 drum E being transmitted through the capstan J and disk L by the capstan-bars, which ship in the upper half of capstan J.

The usual handing wheel-gear is provided for steering from the bridge, and on the au-
85 tomatic gear-spindle N a toothed wheel N' is secured, which gears with a pinion O on a stud O', carried in the plate-cover D of the chain-drum casing D', said pinion O or a second pinion secured to it being geared to the
90 internal teeth or, as shown, gearing with external teeth on the chain-drum E, so that the handing-gear is always in position. A hand-wheel on the top of the automatic gear-spindle N allows of the controlling-valve being
95 moved in either direction for working the capstan J by steam, no disconnecting-gear being used.

As an alternative the pinions C, instead of being carried on studs in the cover D of the
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chain-drum casing D' and gearing with internal teeth on the chain-drum E, may be carried in studs upon the chain-drum and gear with teeth upon the chain-drum casing.

5 The capstan J may be dispensed with, the other parts alone being used as a steering-gear, in which case the worm-wheel H instead of being loose upon the central shaft is keyed thereto.

10 Having now described the invention, what I claim, and desire to secure by Letters Patent, is—

1. The combined steering and warping gear comprising a drum-casing, a chain-drum ro-
15 tatable in said casing, one of said parts being provided with teeth, toothed pinions within said casing and gearing with said mentioned teeth, a rotatable spindle provided with a pin-
20 ion gearing with said toothed pinions, a worm-wheel rotatable on said spindle, a worm-shaft for driving the worm-wheel, a capstan made in parts separately connected together and having one part connected to the worm-wheel
25 spindle to turn therewith and separably con-

nected to one part of the capstan, substantially as described.

2. The combined steering and warping gear composed of a drum-casing having a central boss, a chain-drum centered loosely upon said 30 boss and formed with gear-teeth, toothed pinions supported from the drum-casing and gearing with the drum, a rotatable spindle provided with a pinion gearing with said toothed pinions, a worm-wheel rotatable on 35 said spindle, a worm-shaft for driving the worm-wheel, a capstan made in parts separably connected together and having one part connected to the worm-wheel to turn there-
40 with, and a disk connected to the spindle to turn therewith and separably connected to one part of the capstan, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ROBERT RICHARDSON.

Witnesses:

JAMES SMITH,

JAMES PATERSON.