

F. C. KAINER.
STEERING GEAR.
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1,089,136.

Patented Mar. 3, 1914.

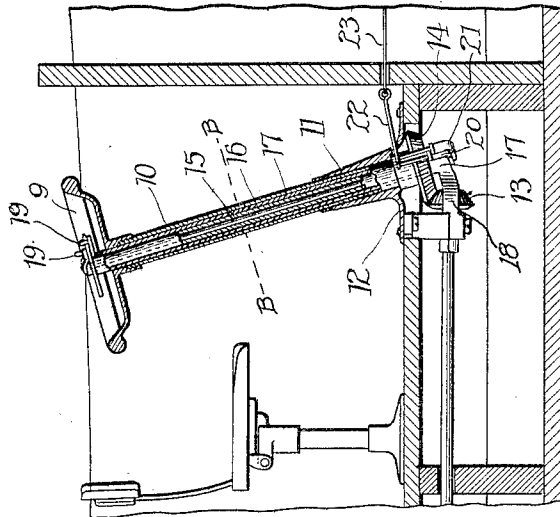
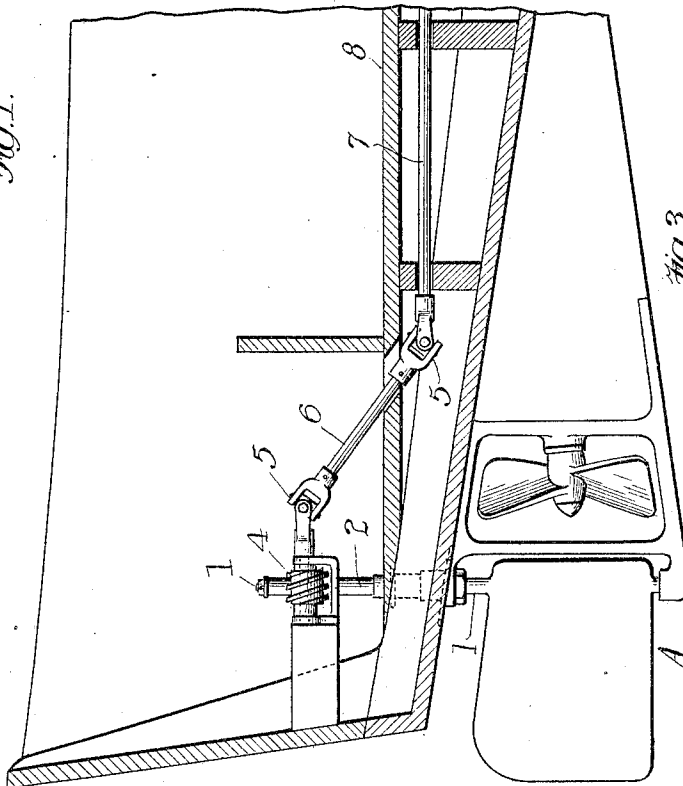


Fig. 1.



Witnesses
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Fig. 4.

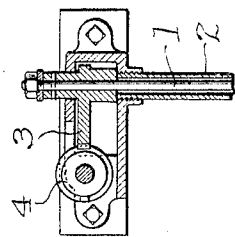


Fig. 5.

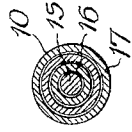


Fig. 3.

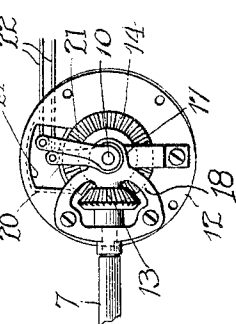
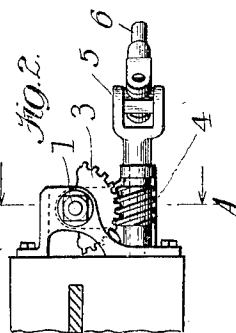


Fig. 2.



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STEERING-GEAR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK C. KAINER, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Steering-Gears, of which the following is a specification.

The main objects of this invention are to provide an improved form of steering-gear for marine vessels, and particularly adapted for high speed launches and motor boats driven by internal combustion and other engines which may be controlled from the helmsman's seat; and to provide a steering-gear of this type which will entirely obviate the necessity of the use of cables in transmitting the power from the steering-wheel to the rudder, and which will thereby be practically devoid of objectionable lost motion.

A specific embodiment of this invention as applied to a motor driven launch is illustrated in the accompanying drawings in which:

Figure 1 is a fragmentary longitudinal section of a boat equipped with the herein described steering gear. Fig. 2 is a top plan of the worm and gear mechanism for rotating the rudder. Fig. 3 is a bottom plan of the mechanism below the lower end of the steering-post pedestal. Fig. 4 is a sectional detail taken on the line A—A of Fig. 2. Fig. 5 is a transverse section of the steering-post taken on the line B—B of Fig. 1.

In the form shown in the drawings, the rudder-post 1 is journaled within a tubular housing or rudder-pipe 2 and carries at its upper end a worm-gear-sector 3 which meshes with a horizontally disposed worm 4 journaled at one side of the rudder-post. A pair of universal joints 5 and an inclined shaft 6 connect the worm 4 with a line-shaft 7 located below the floor or deck 8 of the vessel.

The steering-wheel 9 may be located in any convenient position in the vessel and is carried by a tubular steering-post 10 extending longitudinally through and journaled in an upright pedestal 11, which pedestal is provided with a broad base flange 12 whereby it may be attached to a deck. In the form shown it is attached to the forward end of the deck 8. A pair of bevel gears 13 and 14 connect the steering-post with the line shaft 7.

Extending longitudinally through the tubular steering-post 10 is a pair of shafts 15 and 16 preferably located one concentrically within the other. These are journaled in a stationary tube 17 supported by a bracket 18 below the pedestal and are separately rotatable, each being entirely independent of the steering-post 10. At the upper ends of the shafts 15 and 16 are small hand-levers 19, which may have the usual detent pawls coacting with suitable racks above the steering-wheel as in an automobile. The lower ends of the shafts 15 and 16 extend below the supporting bracket 18 and are provided with arms or fittings 20 and 21, which in turn are provided with links 22 for connecting the arms 20 and 21 with the cables or rods 23 which respectively control the spark timer and the admission of fuel to the motor. The arms 20 and 21 extend upwardly around the gear 14 into a pocket 24 in the base of the pedestal 11 in order to enable the connection to the engine to be made above the level of the deck 8.

When the steering-wheel 9 is rotated the movement is transmitted by the steering-post 10 and bevel gears to the shaft 7, thence to the universal joints and inclined shaft 6 to the worm 4 which in turn rotates the gear-sector 3 and the rudder post 1. As the worm-gearing is self locking the rudder will remain in any position in which it is set and no strain upon the rudder will be transmitted to the steering-wheel. The hand-levers 19, being within convenient reach of the operator's hands while he grasps the wheel 9, enable him to advance or retard the spark and regulate the fuel feed without releasing his hands from the hand-wheel 9, this mechanism being similar in function to the corresponding mechanism in an automobile steering-gear.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. In a device of the class described, the combination of a rudder, a vertically disposed steering-post, a pedestal in which said steering-post is journaled, mechanism connecting the lower end of said steering-post

with said rudder for operating the latter through the rotation of said steering-post, a bracket below said steering-post, a tubular shaft rotatably supported by said bracket and extending longitudinally through said steering-post, a second shaft extending through said tubular shaft, means at the upper end of said tubular and second shafts for separately rotating them, and arms at the lower ends of said tubular and second shafts adapted for operating controlling devices of an engine, said arms being bent upwardly and extending upward outside of said steering-post.

2. In a boat having a floor with an opening thereunder, an upright rudder post at the rear end, in combination with steering means positioned forward of said rudder post and projecting downwardly below said floor, a concealed and longitudinally disposed shaft rotatably journaled in a substantially horizontal position in said opening beneath the floor and operatively geared at its forward end to the lower end of said steering means, a horizontally disposed and laterally projecting gear sector rigidly attached to the upper end of said rudder post, a longitudinally disposed worm journaled beside and arranged to mesh operatively with said gear sector for oscillating the same and adapted normally to hold the same rigidly in fixed position, and a longitudinally disposed and downwardly inclined shaft having universal joint connection at its upper and rear end with the forward end of said inclined shaft being arranged to project beneath the said floor and having universal joint connection with the rear end of said concealed shaft.

3. In a boat of the class described, a rudder post journaled in substantially vertical position, in combination with a substantially horizontally disposed and laterally projecting gear sector fixed to the upper end of said rudder post, a worm disposed substantially longitudinally and journaled to mesh operatively with said gear sector, an inclined shaft having universal joint connection at its upper and rear end with the forward end of said worm, and at its forward and lower end projecting downwardly beneath the floor of the boat, and steering means operatively connected beneath the floor with the said forward and lower end of the inclined shaft.

Signed at Chicago this 20th day of December, 1912.

FREDERICK C. KAINER.

Witnesses:

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