No. 896,921. PATENTED AUG. 25, 1908.

E. J. KELLEY.

TORPEDO BOAT.

APPLICATION FILED AUG. 6, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

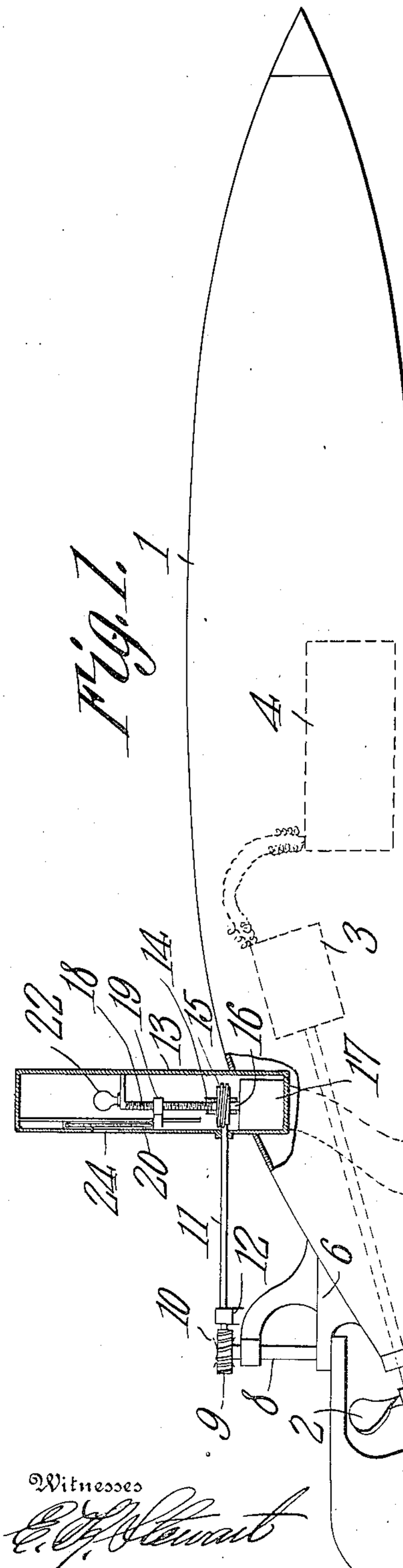


Fig. 2.

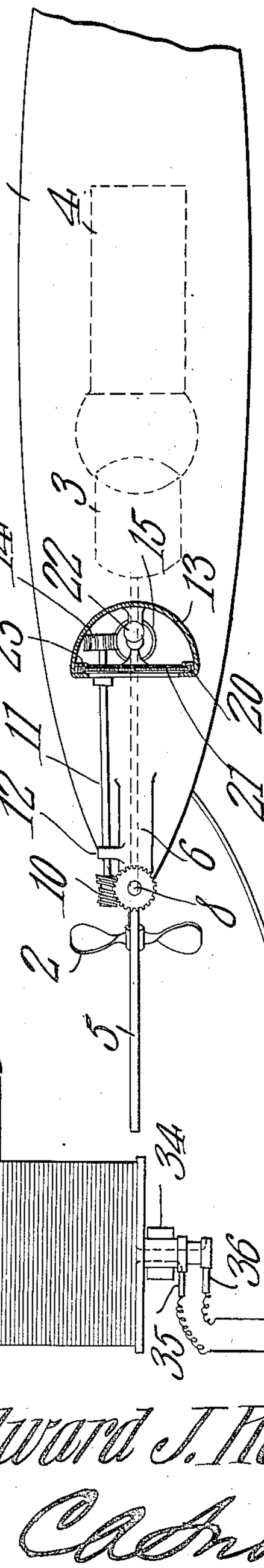
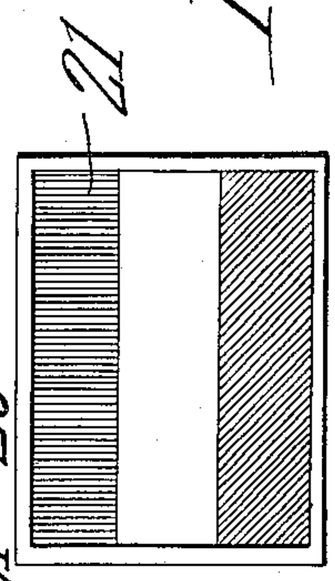
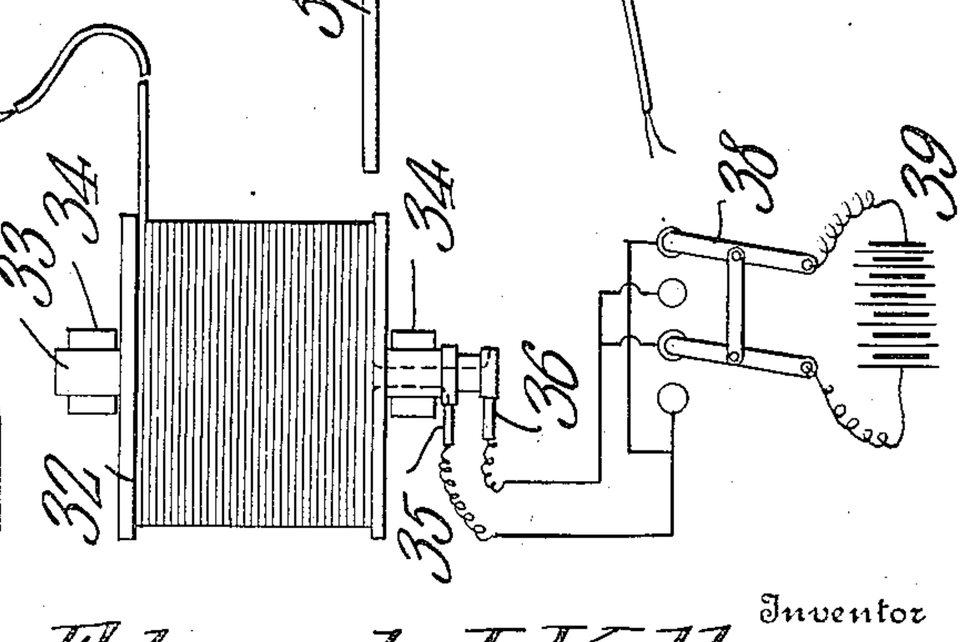


Fig. 4.





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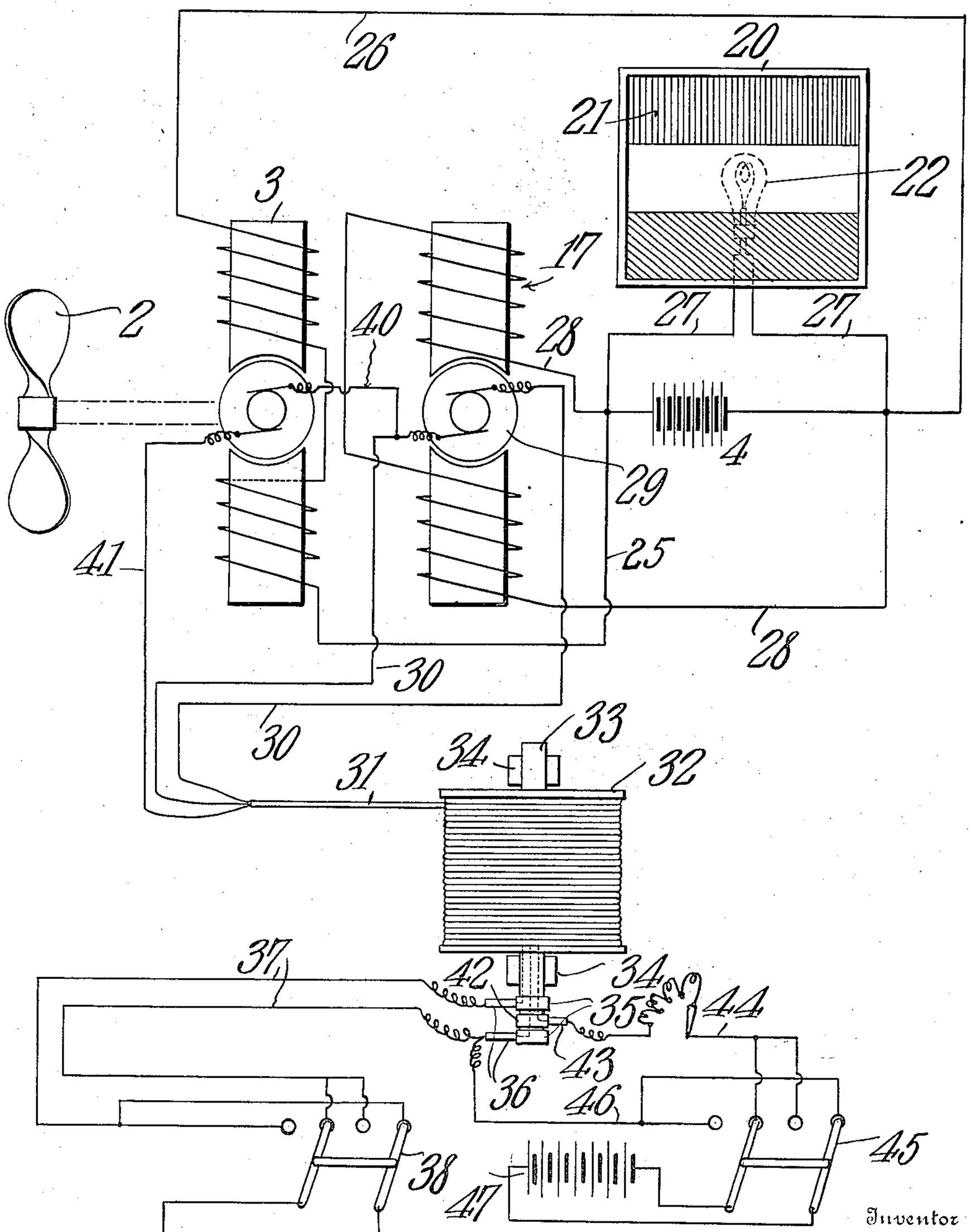
2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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TORPEDO-BOAT.

No. 896,921. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed August 6, 1907. Serial No. 387,340.

To all whom it may concern:

Be it known that I, EDWARD J. KELLEY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a new and useful Torpedo-Boat, of which the following is a specification.

This invention has reference to improvements in torpedo boats, and its object is to provide means whereby the boat may be directed at night without being visible to the enemy. For this purpose there is provided a steering mechanism controllable from a distance, either from the shore or, if need be, from a vessel, with means rendered visible by the position of the steering mechanism for indicating to an observer the direction in which the boat is traveling.

Specifically, the invention comprises a hooded light visible in the direction from which the boat is traveling but invisible in the direction toward which the boat is traveling, and across the path of the light in the direction in which it is visible there is arranged a means movable with the steering gear whereby the character of the light or its visibility is so modified as to indicate to the observer that the boat is going straight ahead, or to starboard, or to port, as the case may be.

In order that the steering may be accomplished from a distant point, in a positive manner, the steering mechanism is propelled by electric power conducted to a suitable motor upon the boat through a flexible conducting cable which unwinds from a reel at the controlling point and through which the current is fed to the motor in such manner that the direction of rotation of the latter may be changed at will. In this way, while the propelling means for the boat may be carried upon the boat and be independent, if desired, from distant control, the steering is under the control of an operator distantly located upon shore or upon a vessel, and the only means necessary for the control of the steering of the boat is such means as will give to the distant operator power to direct the rudder of the boat to control its course.

The invention will be fully understood from the following detailed description, taken in connection with the accompanying drawings forming part of this specification, in which,—

Figure 1 is a side elevation of a torpedo boat, showing the steering gear and a portion of the structure adjacent thereto, in section; Fig. 2 is a plan view of the rudder portion of a torpedo boat constructed in accordance with the invention, with parts broken away; Fig. 3 is a diagram of circuit connections which may be used in conjunction with the present invention; and Fig. 4 is a detached view of a movable, multi-color screen for indicating the direction of movement of the boat.

Referring to the drawings, there is shown a torpedo boat 1 which may be taken as typical of any suitable form of torpedo boat. The boat is provided with a propeller 2 which may be driven by an electric motor 3, simply indicated in dotted lines in Figs. 1 and 2 and shown diagrammatically in Fig. 3. This motor 3 is fed by a battery 4 or other suitable source of current carried upon the boat. While in Fig. 3 the propeller motor is shown as a series motor it may, of course, be a shunt-wound motor or other type, or may even be an air motor instead of an electric motor. For the purposes of the present invention what driving power is used by the propeller is immaterial.

The torpedo boat is provided with a rudder 5 which is shown as mounted upon a bracket 6 above the propeller and upon a keel 7 below the propeller and fast to the boat body. The rudder 5 has its upper pivot 8 extended to form a rudder post. On the upper end of the rudder post 8 there is secured a worm-wheel 9 engaged by a worm 10 on one end of a shaft 11 having a journal bearing 12 fast on the bracket 6, and the other end of this shaft 11 extends through one wall of and into a casing 13 rising from the top of the torpedo boat. The end of the shaft 11 within the casing 13 carries a worm-wheel 14 meshing with another worm-wheel 15 fast on a shaft 16 rising from and propelled by an electric motor 17. The shaft 16 extends above the worm-wheel 15 and is there threaded, as shown at 18, and receives a threaded bracket 19 fast to a suitable frame 20 containing panels 21 of differently colored glass, say, red and green respectively at the ends and white intermediate of the red and green. Also within the casing 13 there is an electric lamp 22.

The casing 13 may be semi-cylindrical in shape, with the curved face toward the bow

of the boat and the flat face toward the stern of the boat, and within the casing are guideways 23 within which the frame 20 is arranged to slide close to the flat face of the casing, and through this flat face of the casing there is provided a horizontal slit or opening 24 by which the glass panels may be made to move. Now, assuming that the motor 17 is energized so that its armature will rotate and propel the shaft 16 in the desired direction, it will be seen that through the worm gear 14 and 15, the shaft 11 and the other worm gearing 9 and 10 the rudder will be moved about its pivot supports in a corresponding direction, and at the same time the frame 20 carrying the glass panels 21 will be moved up or down, depending upon the direction of rotation of the motor 17.

The parts are so timed and adjusted that when the rudder is straight and the torpedo boat is traveling directly ahead the white panel will be opposite the opening 24 and a white light will be there displayed. When the rudder is turned upon its pivot to direct the boat to starboard or port, as the case may be, a red or a green light will be displayed, since the frame 20 will be moved up or down until the red or green glass screen is brought opposite the opening 24. Thus a distant observer will be able to tell at night whether the boat is responding to its rudder, or whether the boat is following a direct course, or whether the rudder has been turned to one side or the other, by observing the display of light through the opening 24. It is to be noted that the opening 24 is toward the stern of the boat, and, therefore, while visible to an observer located at the point from which the boat is traveling, the light will be invisible to an observer toward whom the boat is traveling. Hence, when the torpedo boat is used at night it may be directed by an observer located at some distant point, toward an enemy, without danger that the boat will be observed by the enemy because of the light displayed.

Referring more particularly to the diagram shown in Fig. 3, it will be seen that the battery 4 is connected up by conductors 25 and 26 to the field of the motor 3, which, in turn, drives the propeller 2, and it will also be seen that the motor 3 has its field separately excited, or this motor may be a series motor, but it will be understood that a shunt-wound motor or other type of motor may be used. The battery 4 is also connected to the lamp 22 through conductors 27. Likewise, the battery 4 is connected up by conductors 28 to the field of the motor 17, so that the latter is constantly energized while the boat is traveling. The armature 29 of the motor 17 is, however, connected up to conductors 30 which are inclosed in a sheath to form a cable 31 exterior to the boat and, of course, rendered waterproof in any well-known manner. The cable 31 extends to the shore or to a vessel from which the torpedo boat is to be directed, and there the cable is wound upon a reel 32, the shaft or spindle 33 of which is provided with suitable journal supports 34 and also carries two insulated collecting rings 35 upon which bear brushes 36. The rings 35 are connected respectively to the two conductors 30 and the brushes 36 are connected to two other conductors 37 extending to a pole-changing switch 38 in the circuit of the battery 39. Now, let it be supposed that the motor 3 is operating and the propeller is also operating to drive the boat through the water, while the cable 31 is unreeling from the reel 32. The distant operator, desiring to steer the boat, moves the switch 38 in a direction to couple up the battery to the armature 29 of the motor 17 so as to energize the latter in a certain direction. Now, the field of the motor 17 being constantly energized in one direction only, the armature 29 will proceed to rotate in a certain definite direction, and the rudder will be slowly turned in a corresponding direction, while the frame 20 will be lifted or lowered, as the case may be, at the same time the rudder is turned and in the same proportion. When the operator so desires he may reverse the current through the armature by means of the switch 38 and the armature will proceed to rotate in the opposite direction whereupon the rudder will swing in a corresponding direction and the frame 20 will be moved in like manner. Let it be assumed that when the rudder is in the central position, so that the boat is going straight ahead, that the white glass panel is between the lamp 22 and the slot or orifice 24. The operator will then see a white light displayed and he will know that the rudder is central. In like manner when he sees a red light displayed he will know that the rudder is in position to cause the boat to turn in a certain direction, while when he sees a green light displayed he will know that the boat is turning in the other direction. This is, of course, under the assumption that red and green are the colors chosen. Other means may be employed for modifying the light in such manner as to show to the observer controlling the boat the position of the rudder. It will be understood, of course, that these lights are invisible to the enemy toward whom the boat is directed, since the opaque side of the casing 13 is always presented to the enemy.

It has been hereinbefore stated that the motor 3 may be driven by the battery 4. In Fig. 3, however, a somewhat different arrangement is shown wherein the battery 4 excites the field only of the motor 3. The armature of this motor is connected on one side by a branch wire 40 to one of the conductors 30, while another conductor 41 is in-

cluded in the cable 31 and leads at the other end to a collecting ring 42 fast on the spindle 33 of the reel 32, and a collecting brush 43, bearing upon this ring 42, is connected by a conductor 44 to a pole-changing switch 45 which, in turn, is also connected to one of the brushes 36 bearing upon one of the collecting rings 35 by another conductor 46. The pole-changing switch 45 may include a battery 47 or other source of electric current, or it may be branched off from the battery 39 if so desired. Also, other controlling means may be included in the circuit in which is located the pole-changing switch 45. By this arrangement an operator at a distant point is enabled to control the direction of rotation and, if need be, the speed of the motor 3, so that in addition to controlling the steering of the torpedo boat its progress may also be controlled.

I claim:—

1. A torpedo boat provided with a rudder, means for controlling the rudder from a distance, a light constituting a visible signal, means for hiding the light from observation except from a point from which the boat is receding, and means under the control of the rudder-actuating means for changing the color of the light constituting the signal in accordance with the position of the rudder with relation to the boat.

2. A torpedo boat provided with a rudder, means for operating the rudder to steer the boat, a single visible signal, and means under the control of the rudder-operating mechanism for varying the color of the visible signal in accordance with the position of the rudder with relation to the boat.

3. A torpedo boat provided with a rudder, means for operating the rudder from a distance to steer the boat, a single signal visible only from the rear of the boat, means for changing the visual character of the signal, and connections between the rudder-controlling mechanism and the signal-varying means for operating them in unison.

4. A torpedo boat provided with a rudder, an electric motor, connections between the motor and the rudder, electric connections between the motor and a distant point of control, means for controlling the direction of rotation of the motor at such distant point of control, a visual signal upon the boat, means for hiding said signal except toward the point from which the boat is receding, and colored screens connected to the rudder-actuating mechanism and movable into the path of visibility of the signal.

5. In a torpedo boat, a suitable casing provided with an aperture toward the stern of the boat, an electric light within the casing and invisible except through the aperture, rudder-controlling means upon the boat, and colored screens movable across the aperture in the casing in coincidence with the movement of the rudder.

6. In a torpedo boat, a suitable rudder, an electric motor carried on the boat, speed-reducing gear between the motor and the rudder, a signal light carried on the boat, a casing for the same having an aperture toward the rear of the boat, colored screens movable across the aperture in the casing, and connections between the motor and screens whereby the latter are moved across the aperture in the casing in synchronism with the movement of the rudder.

7. A torpedo boat provided with an electric motor for driving the propeller, another electric motor for controlling the rudder, a source of electric current located at a distant point, flexible conductors connected to the motors, controllers included between the source of power and the motors, an electric light carried by the boat and visible only from the rear of the boat, and a colored screen connected to the rudder-operating motor and movable thereby across the path of the light to indicate by the visible character of the signal the position of the rudder with relation to the longitudinal axis of the boat.

8. A torpedo boat having an electric motor thereon for driving the boat, another electric motor for actuating the rudder, flexible conductors leading from the motors, a reel at a distant point carrying said conductors, collecting rings on the shaft of the reel and independently connected to the conductors, a source of current, means for controlling the current to control the motors, an electric light on the boat, a casing for hiding the light except from the rear of the boat, and colored screens connected to the rudder-operating motor and movable thereby across the path of the light to indicate the position of the rudder with relation to the longitudinal axis of the boat.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDWARD J. KELLEY.

Witnesses:
JAS. M. WALKER,
FRANK S. APPLEMAN.