(No Model.) 3 Sheets—Sheet 1.

L. R. JONES.

ELECTRICAL DEVICE FOR PROPELLING BOATS.

No. 600,874. Patented Mar. 22, 1898.

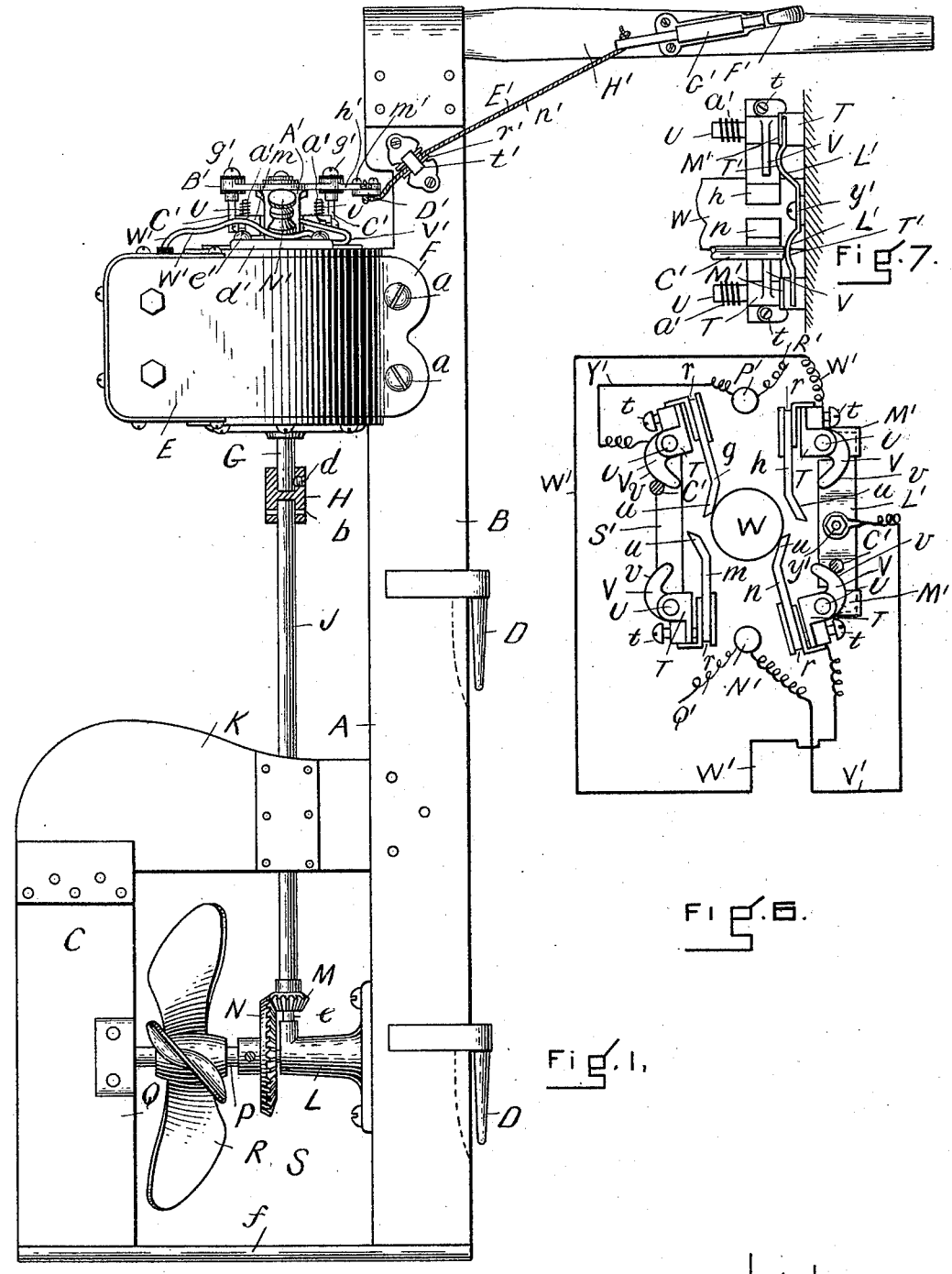

Fig. 7.

Fig. 6.

Fig. 1.

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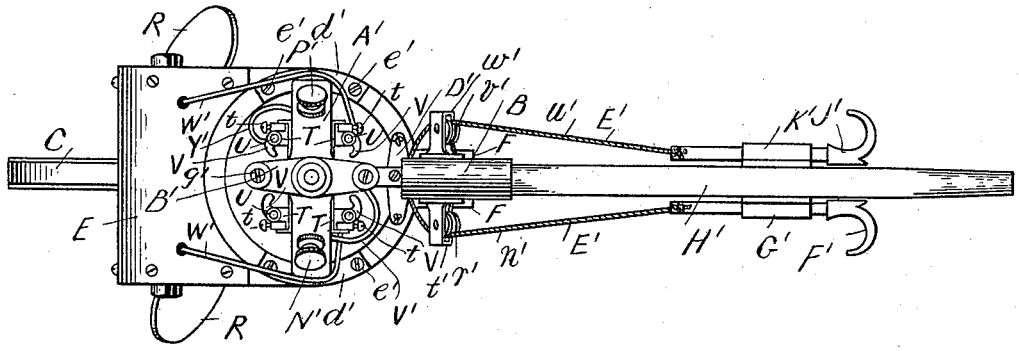

Fig. 2.

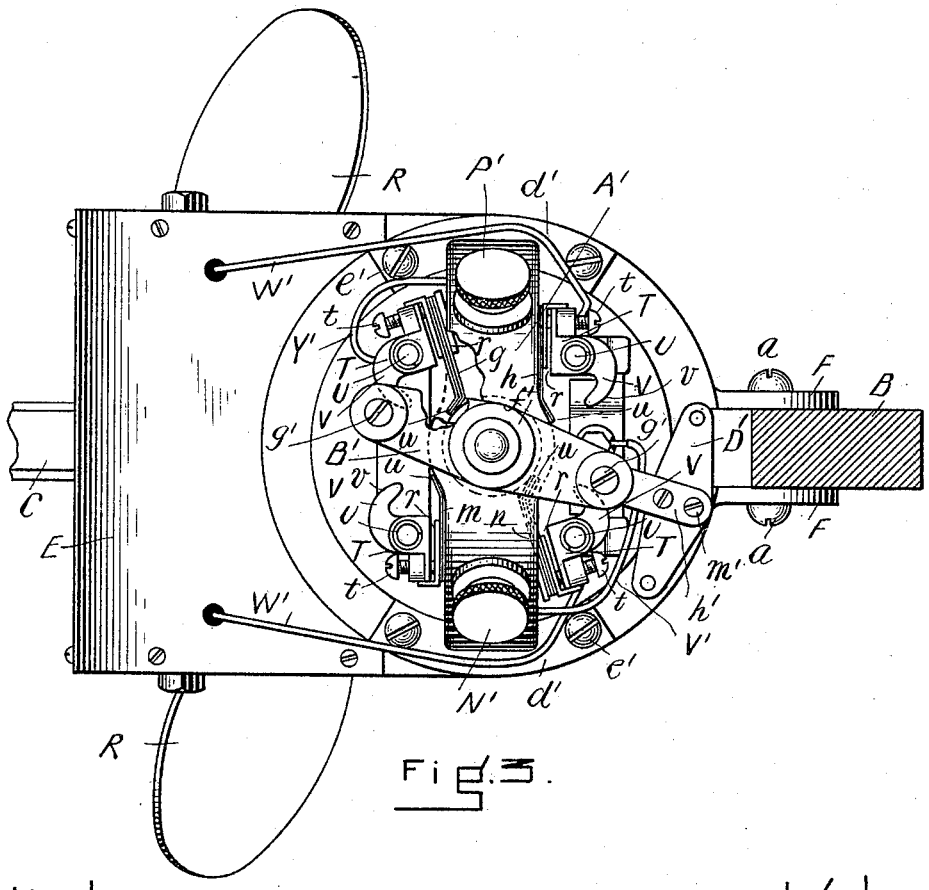

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

L. R. JONES.

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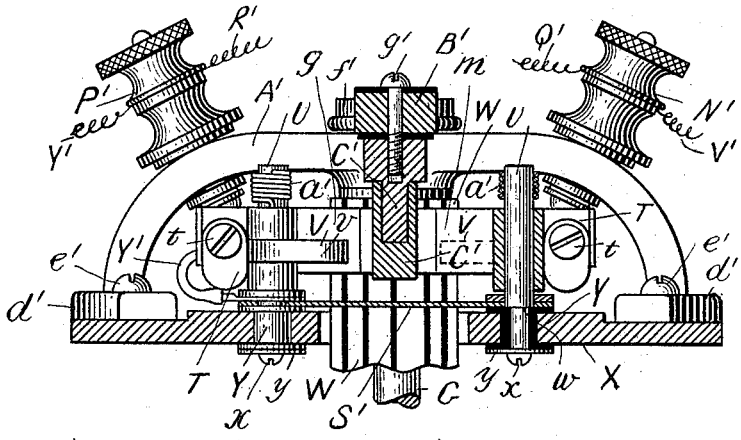

Fig. 4.

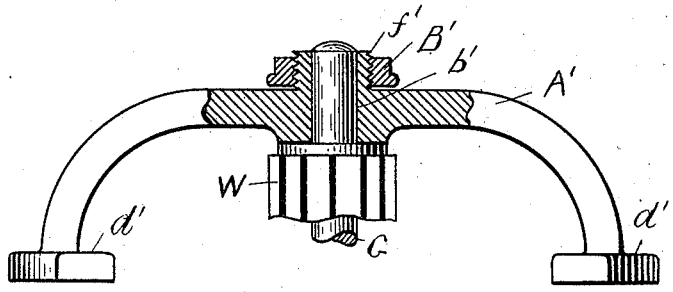

Fig. 5

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UNITED STATES PATENT OFFICE.

LYMAN R. JONES, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO SAMUEL JACKSON AND WILLIAM POTTER, JR., TRUSTEES, OF SAME PLACE.

ELECTRICAL DEVICE FOR PROPELLING BOATS.

SPECIFICATION forming part of Letters Patent No. 600,874, dated March 22, 1898.

Application filed July 2, 1895. Serial No. 554,736. (No model.)

To all whom it may concern:

Be it known that I, LYMAN R. JONES, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electrical Devices for Propelling Boats or other Water-Craft, of which the following is a full, clear, and exact description.

This invention consists, in combination with a rudder of a boat or other water-craft, of a propeller-wheel, an electric motor, brushes, a commutator, and means for moving the brushes into contact with the commutator, all constructed and arranged for operation substantially as hereinafter fully described reference being had to the accompanying sheets of drawings, in which is illustrated the rudder of a boat detached therefrom and having this invention applied thereto.

Figure 1 is a side elevation of the rudder with the electric motor and propeller attached thereto. Fig. 2 is a plan view of Fig. 1. Fig. 3 is an enlarged plan view with some of the parts broken out and the rudder-post in cross-section. Fig. 4 is a detail elevation and detail vertical section. Fig. 5 is a detail elevation and partial vertical section. Fig. 6 is a detail plan view with a diagram representing the electric circuit. Fig. 7 is a detail elevation of one side of Fig. 6.

In the drawings, A represents a rudder of a boat or other water-craft, consisting of a post B and a blade C and having pintles D for hanging it to the boat, all constructed in the usual manner of making rudders, except as to the necessary changes for the application of the present invention.

E is a box secured to the post B by two vertical lugs or plates F, extending from the back of the box, which embrace the post B and are secured by screws *a*, passing through the plates and screwing into the post, rigidly holding the box to the rudder-post. In this box is placed and secured the electric motor, which is constructed and arranged for operation in the usual manner, and therefore needs no description or illustration herein.

The shaft G of the motor extends through the bottom of the box and a short distance below, its lower end being secured by a sleeve or coupler H to the upper end of a vertical shaft J by a screw *d* and a rivet *b*, respectively, the shaft J extending down through a bearing in the upper part K of the rudder-blade C, its lower end *e* turning in a bearing in a support L, secured to the back edge of the post B. The shaft J has secured to it near its lower end a horizontal miter-gear M, which engages with another larger miter-gear N, secured to a horizontal shaft P, arranged to turn in bearings in the support L and a bearing in the outer vertical portion Q of the rudder-blade. To this horizontal shaft is also secured the propelling-wheel R, which is constructed of any of the usual shapes or forms and material, and therefore needs no particular description herein.

The rudder-blade has a central open space S, as shown, to allow for the propeller, gears, &c., to be attached, as described, the blade consisting of the horizontal portion K and vertical portion Q, secured thereto, the vertical portion being connected at its lower end by a rod or bar *f* to the lower end of the post.

As the electric motor is operated its shaft G in turning communicates motion to the propeller-wheel R through the shaft J and gear connections, propelling the boat.

g, *h*, *m*, and *n* are four brushes constructed and arranged for operation alike, the description of one and its connecting parts answering for all. Each brush consists of a series of thin plates or sheets of suitable metal placed together side by side and inserted edgewise in an open recess *r* in a block or holder T and firmly secured therein by a screw *t*. The brush-holder is arranged to rock horizontally on a post U as a pivot secured to the top of the box, as shown in Fig. 4 more particularly. The free ends *u* of the brush-plates are bent sidewise outwardly at an angle, as shown in Figs. 3 and 4 more particularly.

The brush-holder has a curved arm V, and by pressing its outer side *v* the block or holder is swung inwardly for the free ends *u* of the brush to bear against the commutator W on the electric-motor shaft G, which projects up above the box for such purpose.

The lower end of each post U extends through the top X of the box, resting by its shoulder *w* on the top, and it is secured to the top by a screw *x* and washer *y*, being insu-

lated from the top by a flanged sleeve Y, as shown in Fig. 4 in cross-section.

On the post U of each brush-holder T is a spiral spring a', which is connected by one end to the block and by its other end to the post, as shown in Fig. 4, the tension of which acts to hold the brush-holder with its brush in its normal positions and to return it thereto if moved therefrom.

The motor-shaft G extends above the commutator W and turns in a bearing b' in a supporting cross plate or arm A', its central portion being curved upward somewhat to be above and clear of the four brushes and secured by its arms d' to the top of the box by screws e'.

The central portion f' of the supporting-arm A' is raised and has an external screw-thread over which is freely screwed a cross-arm B', so it can freely swing horizontally back and forth thereon as a pivot, and from each end of this arm depends at right angles a round pin C', secured by a screw g', which pin is made preferably of insulating material, and these pins project down a little below the horizontal plane of the arms V of the brush-holders T and are so located on the arm B' that when the arm is in its normal position (shown in Fig. 2) each pin will be centrally in the space midway between the arms V of the two brush-holders in the same line. (See Fig. 6.) If this arm B' is swung from the position shown in Fig. 2 into the position shown in Fig. 3, its pins C' will press laterally against the outer sides v of the arms V of the holders T of the brushes g n, respectively, diagonally opposite to each other, as in Fig. 6, and swing them for their brushes to bear and press upon the commutator W, as shown in Fig. 6, and making an electric contact through these two brushes and the commutator, and if the arm is swung in the opposite direction the pins C' will press upon the arms V of the holders of the brushes m h, respectively, and swing these holders to make electric contact through their brushes with the commutator, the other brushes being moved back and from contact with the commutator into their normal positions by their springs a' and breaking the electric circuit with the commutator. With the electrical current on, when the brushes g n are in contact with the commutator W the propeller-wheel R is turned in one direction, and when the opposite brushes m h are in contact with the commutator the propeller-wheel is turned in the opposite direction. To operate this arm B', there is attached by screws m' to an extension h on one end a cross-bar D', from each end of which extends forward a rope or chain E, the two chains crossing each other, the one n' passing over a pulley r', secured by a bracket t' to one side of the post B and connected to a handle F', adapted to slide in guideways G' on one side of the tiller H' of the rudder, the other chain u' passing over a pulley v', secured by a bracket w' to the other or opposite side of the post and connected by its end to a handle J', adapted to slide in a guideway K' on the opposite side of the tiller. Pulling the handle F' it will swing the arm B' from the position shown in Fig. 2 into the position shown in Fig. 3, and in such movement its pins C' will press against the arms V of the holders T of the brushes g n and swing the holders for their brushes to be in contact with the commutator, as shown in Figs. 3 and 6, and pulling the other handle J' the arm B' will be swung in the opposite direction and by its pins C' press against the arms V of the holders T of the brushes m h and swing the holders for their brushes to be in contact with the commutator, and thus the current of electricity from the battery will be caused to enter the electric motor from one side or the other, as the case may be, to turn the motor in one or the other direction to operate the propeller-wheel, as desired, to move the boat forward or backward.

When the arm B' is in its normal position, (shown in Fig. 2,) its pins C' are away from and not bearing upon the brush-holders. Consequently the brushes are not in contact with the commutator, and thus no electric connection is made between the motor and battery, the propeller-wheel being then stationary; but when the arm B' is swung in either direction to press the corresponding brushes against the commutator, as described, the electric circuit is made through the electric motor, which is operated and the propeller-wheel turned in the direction desired.

Secured to the top of the box by a central screw y' is a plate L', made of spring metal, its two ends being bent upward and each pressing by its end against the under side of the arm M', respectively, of the blocks T to brushes h n, making two springs, their bent portions (shown in Fig. 7) being in the line of travel of the pin C' of the arm B' nearest thereto.

The pin C' at the end of the swinging arm B', nearest the rudder-post, extends down far enough for its end to be below the horizontal plane of the upwardly-curved portions T' of the double spring L', so that as the arm B' is swung in either direction from its normal position of Fig. 2 it will ride upon the corresponding curved portion of the spring L' and press it down, so that its end will be away from and out of contact with the arm M' of the holder T of the brush h or n, as the case may be, breaking electric contact between the two, while at the same time the opposite spring will still be in contact with its brush-arm M', as shown in Fig. 7.

N' P' are binding-posts secured to the supporting-arm A', and the post N' is connected by the electric wire Q' with one pole of the battery, and the other binding-post P' by the electric wire R' with the other pole of the battery.

The two posts U of the holders to brushes g m are connected together by a plate S',

making electrical connection between the two posts, and thus the brushes *g m*.

Electricity is supplied from any suitable electric battery which can be placed in suitable position in the boat and connected by wires Q′ R′, respectively, to the binding-posts N′ P′.

With the brushes *g n* in contact with the commutator W, as shown in Fig. 6, by the swinging of the arm B, as described, the electric current from the battery passes to post N′, thence along wires V′ to the spring-plate L′; but as the spring-plate L′ is not in contact with the arm M′ of the holder to brush *n*, as shown in Fig. 7, breaking electric contact therewith, and its other spring end is in contact with the arm M′ of the holder to brush *h*, the current passes to and through brush *h* to its holder to wire W′, to holder T of brush *n*, to commutator W, to brush *g*, through its holder to plate S′, to wire Y′, to post P′, to battery. With the arm B′ then moved to bring the brushes *m h* in contact with the commutator the current moves in the reverse direction from the battery to post P′, along wire Y′, to plate S′, to brush *m*, to commutator W, to brush *h*, and as in this case the end of spring L′ is moved from contact with the arm M′ of the holder to brush *h*, breaking the electrical contact therewith, the current passes through the wire W′, to brush *n*, to spring-plate L′, its arm M′ being in contact with the other end of spring-plate L′, through wire V′, to binding-post N′, to battery.

The various parts are suitably insulated from each other for the proper arrangement of the electrical current for the operation of the device.

Having thus described my invention, what I claim is—

1. In combination, a rudder of a boat or other vessel, an electric motor secured thereto, a propeller-wheel arranged to turn by its shaft in suitable bearings in the rudder and connected to the electric motor for operation thereof, pivoted brushes alternately arranged to make and break contact with the commutator, an arm centrally pivoted to a support, and an insulated pin projecting down from each end of said arm and adapted in the swinging of the arm to move the brushes into contact with the commutator of the electric motor.

2. In combination, a rudder of a boat or other vessel, an electric motor secured thereto, a propeller-wheel arranged to turn by its shaft in suitable bearings in the rudder and connected to the electric motor for operation thereof, pivoted brushes alternately arranged to make and break contact with the commutator, an arm centrally pivoted to a support, and an insulated pin projecting down from each end, and adapted by the swinging of the arm, to move the brushes into contact with the commutator of the electric motor, a cross-arm on one end of said arm, and a chain, or cord connected to each end of said cross-arm and to means on the rudder-tiller for convenient operation thereof.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LYMAN R. JONES.

Witnesses:
EDWIN W. BROWN,
LEONA C. ARNO.