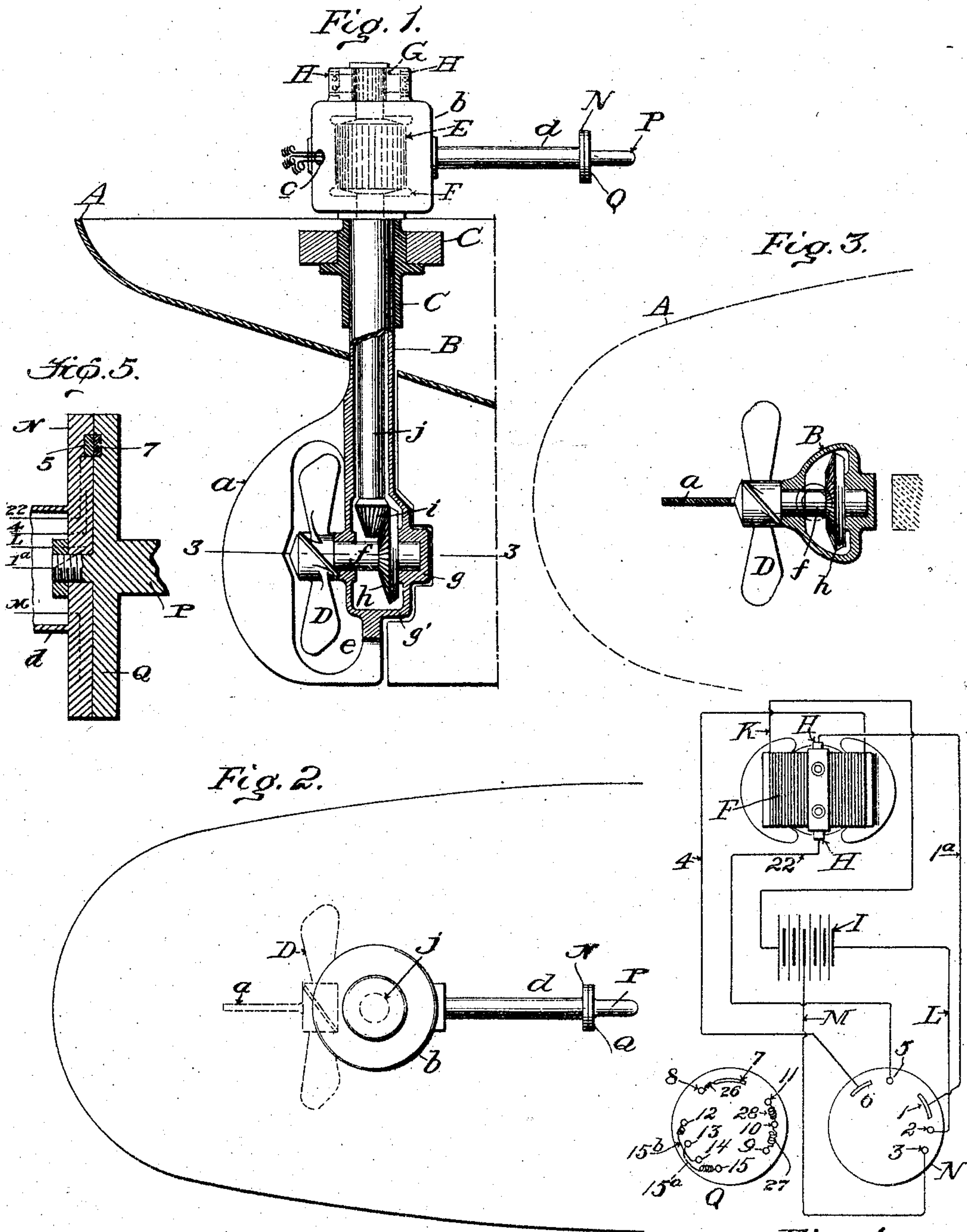


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G. F. ATWOOD.
BOAT PROPELLER.

APPLICATION FILED MAR. 11, 1904.



Witnesses
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UNITED STATES PATENT OFFICE.

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SIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO HERBERT
C. HALL, TRUSTEE.

BOAT-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 778,435, dated December 27, 1904.

Application filed March 11, 1904. Serial No. 197,678.

To all whom it may concern:

Be it known that I, GEORGE FRENCH ATWOOD, a citizen of the United States, residing at Wakefield, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Boat-Propellers, of which the following is a specification.

My invention pertains to electromechanical means for propelling boats, and its novelty, utility, and practical advantages will be fully understood from the following description and claims when taken in connection with the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of the rear portion of a boat equipped with my novel motor. Fig. 2 is a plan view of the same. Fig. 3 is a detail horizontal section taken in the plane indicated by the line 3 3 of Fig. 1. Fig. 4 is a diagrammatic view illustrative of the means for controlling the motor—*i. e.*, the means through the medium of which the motor may be started and stopped and operated at full speed with the full power of the electric generator, at half speed with but a portion of the energy of the generator, and reversed. Fig. 5 is a diametrical section taken through the two disks comprised in my improvements and illustrating the pivotal relation of said disks.

Similar characters designate corresponding parts in all of the views of the drawings, referring to which—

A is a portion of a boat, and B is a vertically-disposed sleeve journaled and supported in a suitable bearing C in the boat, so as to turn on its axis. The said sleeve B is provided on its lower portion with a rudder *a*, which is preferably integral therewith, and on its upper portion it has a casing *b*, provided with an opening *c* for a purpose presently set forth and also with a hollow handle *d*.

D is a propeller which is arranged in an opening *e* in the rudder *a* and is fixed on a shaft *f*, journaled in a bearing *g* at the lower portion of the sleeve B. On its end, within an enlarged portion *g'* of the said sleeve B,

the shaft *f* is provided with a beveled gear *h*, which is intermeshed with a complementary gear *i* on the lower end of a vertical shaft *j*, which extends up through the sleeve B and the casing *b* thereon and is provided within the latter with a rotary armature E.

The electromotor of my improvements is arranged entirely in the casing *b*, and in addition to the armature E it comprises a field-magnet F, a commutator G, and commutator-brushes H, all of which may be, and preferably are, of the ordinary construction and need not, therefore, be particularly described herein.

In virtue of the construction thus far described it will be noticed that when the armature E is rotated the shaft *j* will be rotated, as will also the shaft *f* and the propeller D thereon, and it will also be noticed that when the sleeve B, which serves as a rudderpost, is turned on its axis it will serve, through the medium of the rudder *a*, to steer the boat.

I, Fig. 4, is a source of electric energy of any suitable type, which may be situated at any desired point in the boat.

K is a conductor which extends through the opening *c* in the casing and electrically connects the field-magnet F and the end minus pole of the source of electric energy.

L is a conductor which extends through the opening *c* and is connected to the end plus pole of the source of electric energy.

M is a conductor also carried through the opening *c* and connected to an intermediate plus-pole of the source of electric energy.

N is a disk fixed on the end of the hollow handle or tiller *d*, and P is a handle having a disk Q opposed to and pivotally connected to the disk N. The disk N is provided with a contact 2, to which the conductor L extends; a contact 3, to which the conductor M extends; a contact 6, connected by a conductor 4 with the opposite end of the field-magnet F with reference to the conductor K; a contact 1, connected by a conductor 1^a with one of the commutator-brushes H, and a contact 5, connected through the medium of a conductor 22 with the other commutator-brush H. The several conduc-

tors L, M, 4, 22, and 1^a extend through and are adapted to move with the hollow handle or tiller *d* when the latter is swung in a horizontal plane to steer the boat. The disk Q is provided with contacts 9, 10, and 11, electrically connected by conductors 27 and 28; contacts 7 and 8, electrically connected by a conductor 26; contacts 13 and 15, electrically connected by a conductor 15^a, and contacts 12 and 14, electrically connected by a conductor 15^b.

By reference to Fig. 4 it will be understood that when the handle P on the tiller *d* is in a position to hold the contact 11 on disk Q in engagement with the contact 1 on disk N and the contact 5 in engagement with the contact 7 and the contact 8 in engagement with the contact 6 the circuit will be from the end plus pole of the source of electric energy, through the conductor L, contact 2, contact 10, conductor 28, contact 11, contact 1, conductor 1^a, one of the commutator-brushes H, the commutator G, the other commutator-brush H, the conductor 22, contact 5, contact 7, conductor 26, contact 8, contact 6, conductor 4, the field-magnet F, and the conductor K, to the end minus pole of the source of electric energy. From this it follows that the armature of the motor will be rotated with the full power of the source of electric energy in a direction to propel the boat forwardly. When the handle P is rotated a suitable distance to carry the contact 9 into engagement with the contact 3 and the contact 10 out of engagement with the contact 2, the circuit will be from an intermediate plus pole of the source of electric energy, through conductor M, contact 3, contact 9, conductor 27, contact 10, conductor 28, contact 11, contact 1, conductor 1^a, one of the commutator-brushes H, the commutator G, the other commutator-brush H, the conductor 22, the contact 5, the contact 7, the conductor 26, the contact 8, the contact 6, the conductor 4 the field-magnet, and the conductor K, to the end minus pole of the source of electric energy. With this done the armature of the motor is obviously rotated with but a portion of the energy of the battery, and hence at a slow speed in a direction to propel the boat forward. When the handle P is rotated in the same direction as before sufficiently far to disengage the contact 9 from contact 3 and the contact 10 from contact 2, the electrical connection between the source of electric energy and the motor will be opened and the motor stopped. When, however, the handle is turned in the same direction sufficiently far to place the contacts 12, 13, 14, and 15 in engagement with the contacts 5, 6, 2, and 1, respectively, the circuit will be from the plus pole of the source of energy, through conductor L, contact 2 and contact 14, conductor 15^b, contact 12, contact 5, conductor 22, one of the commutator-brushes H, the commutator G, the other commutator-

brush H, the conductor 1^a, the contact 1, contact 15, conductor 15^a, contact 13, contact 6, the conductor 4, the field-magnet F, the conductor K, to the minus pole of the source of electric energy. Because of this the propeller will be rotated in an opposite direction to that first described and the boat will be moved backwardly.

It will be appreciated from the foregoing that by simply grasping the handle P and moving the tiller *d* in a horizontal plane a person is enabled to steer the boat, also that by turning the said handle on its axis and making and breaking the electric circuit described the party is enabled to readily stop and start the boat and regulate the speed of the same. It will also be appreciated that my improvements are very simple and inexpensive and that all of the working parts are entirely inclosed, and hence protected from the water and weather.

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

1. The combination of a boat, a vertically-disposed sleeve or hollow post journaled in a bearing on the boat, a rudder carried by the sleeve or post and having an opening, a casing arranged on the upper end of the post, and having a hollow handle terminating at its outer end in a disk, a propeller disposed in the opening of the rudder, a shaft carrying the propeller and journaled in the lower portion of the sleeve or post, and provided within the latter with a beveled gear, an upright shaft journaled in the sleeve or hollow post, and provided with a beveled gear intermeshed with that on the propeller-shaft, an electric motor comprising a rotary armature fixed directly on the upright shaft, a source of electric energy, a hand-grasp pivotally connected to the outer end of the hollow handle whereby it is adapted to turn on its axis, and having a disk opposed to that of the handle, and coacting means on the disks for controlling the supply of electric energy to the motor.

2. The combination of a boat, an upright sleeve or hollow post mounted on the boat and movable horizontally, a rudder and a propeller carried by said sleeve or post and movable therewith, a casing on the upper end of the sleeve or post, an electric motor in said casing, a handle or tiller connected to the casing and terminating in a disk, a source of electric energy, a hand-grasp pivotally connected to the handle or tiller so as to turn on its axis, and having a disk opposed to that of the handle or tiller, coacting means on the disks for controlling the supply of electric energy to the motor, and a driving connection between the motor and the propeller for driving the latter by the former.

3. The combination of a boat, an upright sleeve or hollow post mounted on the boat so as to move horizontally, a propeller carried

by said sleeve or post and movable horizontally therewith, a casing on the sleeve or post, an electric motor arranged in said casing and connected with the propeller, a handle or tiller 5 connected to the casing and movable horizontally therewith; the said handle or tiller terminating in a disk provided with contacts, a source of electric energy, electrical connections between the contacts on the disk, the 10 source of electric energy and the motor, and a hand-grasp pivotally connected to the handle or tiller so as to turn on its axis, and having a disk opposed to that of the handle or tiller and provided with contacts adapted to 15 coöperate with those of the first-mentioned disk to regulate the supply of electric energy to the motor.

4. The combination of a boat, a propeller, an electric motor connected with the propeller, a source of electric energy, a handle or 20 tiller terminating at its outer end in a disk, and a hand-grasp pivotally connected to the outer end of the handle so as to turn on its axis, and having a disk opposed to that of the handle or tiller, and coacting means on the 25 said disks for controlling the supply of electric energy to the motor.

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

GEORGE FRENCH ATWOOD.

Witnesses:

SAML. G. EMERSON,

PHILIP M. WHEELER.