No. 638,542. Patented Dec. 5, 1899.

G. F. ATWOOD.

PORTABLE BOAT MOTOR.

(Application filed June 7, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

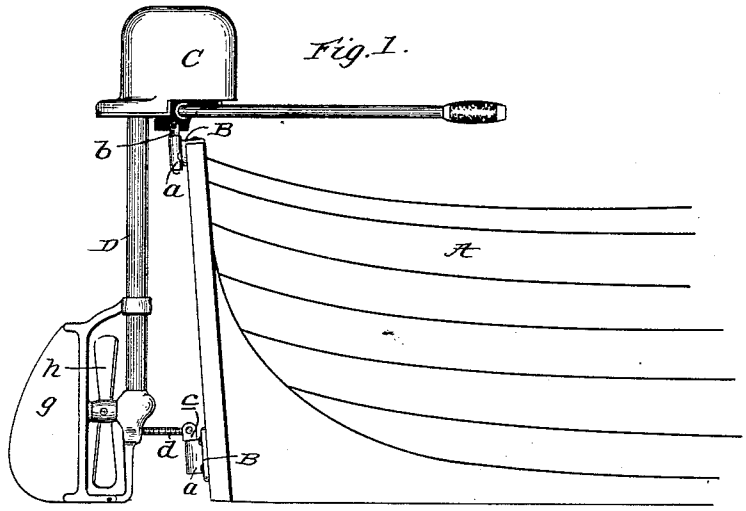


Fig. 2.

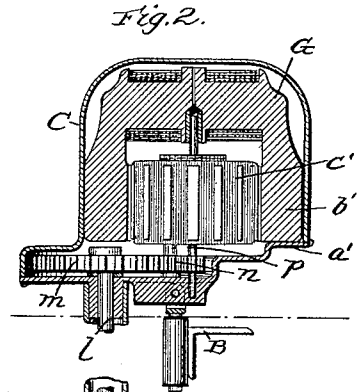


Fig. 3.

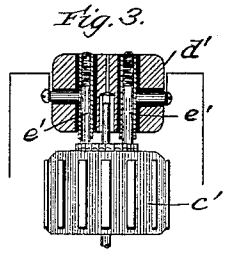
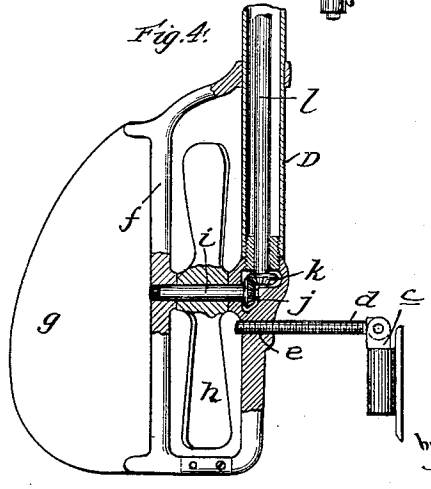


Fig. 4.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 3 Sheets—Sheet 2.

Fig. 5.

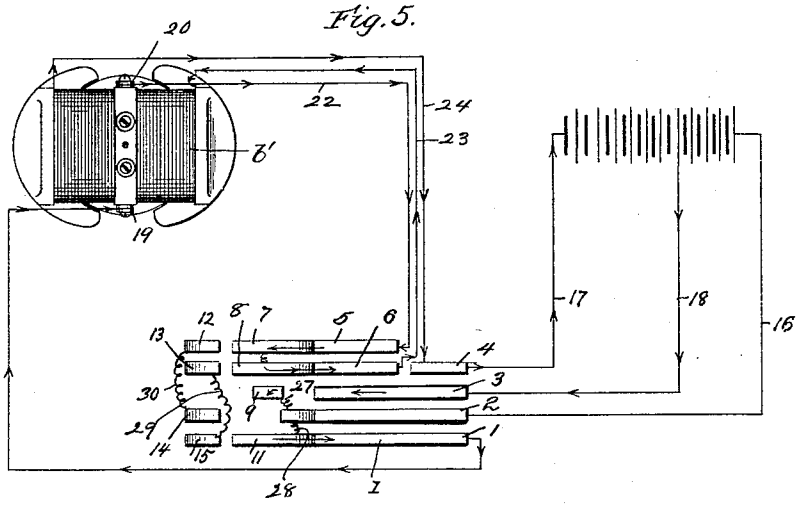
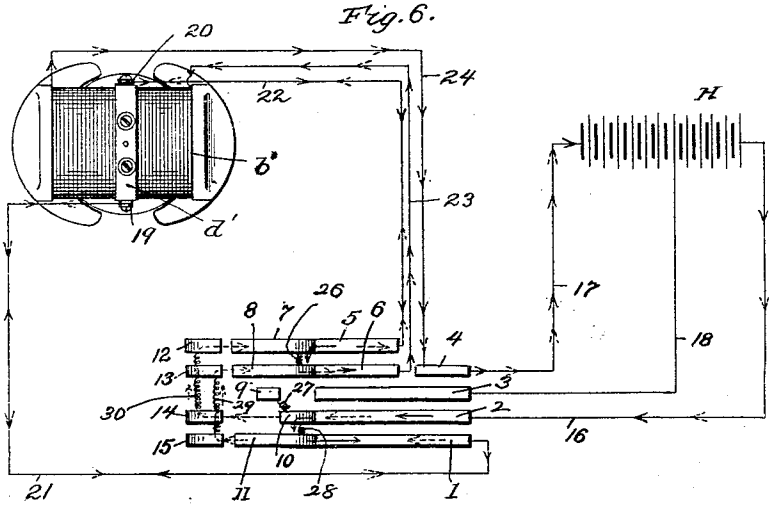


Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

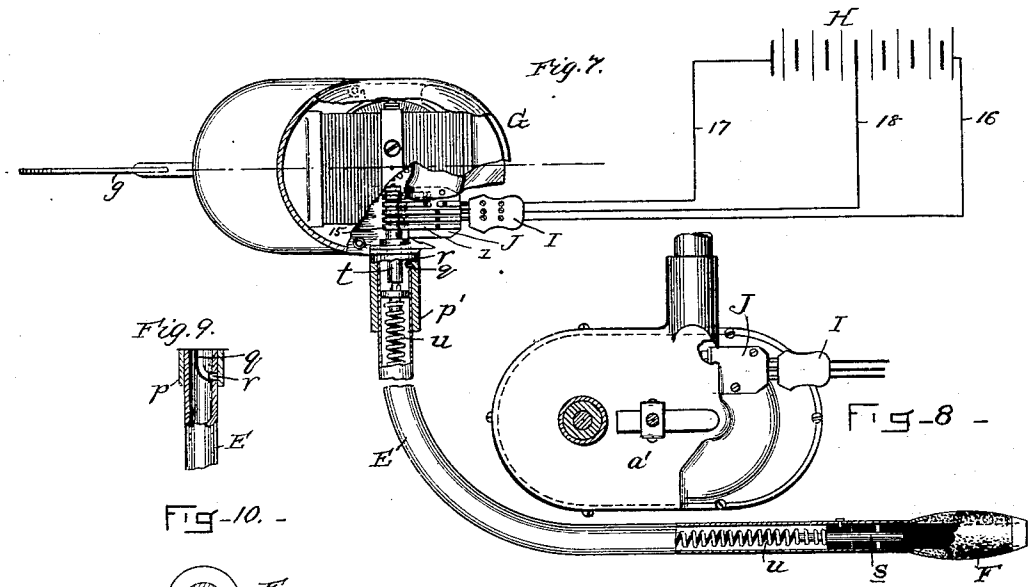

Fig. 7.

Fig. 8.

Fig. 9.

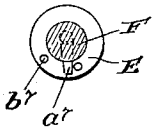

Fig. 10.

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UNITED STATES PATENT OFFICE.

GEORGE F. ATWOOD, OF CHAZY, NEW YORK, ASSIGNOR OF ONE-HALF TO WILLIAM W. WOOD, OF WOOD'S FALLS, NEW YORK.

PORTABLE BOAT-MOTOR.

SPECIFICATION forming part of Letters Patent No. 638,542, dated December 5, 1899.

Application filed June 7, 1899. Serial No. 719,724. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. ATWOOD, a citizen of the United States, residing at West Chazy, in the county of Clinton and State of New York, have invented new and useful Improvements in Portable Boat-Motors, of which the following is a specification.

My invention relates to electromotors for propelling boats; and it has for one of its objects to provide an electromotor adapted to be quickly and easily applied to and as quickly and easily removed from an ordinary boat without altering the construction of the same.

Another object of the invention is to arrange the electromotor in a casing mounted on and connected to a rudder-post and provide a handle connected with the casing, the said handle being adapted to be swung in a horizontal plane to move the rudder and steer the boat and being also adapted to be manipulated for the purpose of controlling the electromotor.

Another object is to provide an electromotor and a controlling device through the medium of which the motor may be readily started and stopped and operated at full speed with the full power of the electric generator and at half-speed with but a portion of the power of the electric generator.

Other objects and advantages of the invention will be fully understood from the following description and claims when taken in conjunction with the annexed drawings, in which—

Figure 1 is a side elevation of the rear portion of a boat with my improved motor and steering apparatus in position thereon. Fig. 2 is a vertical section taken through the motor and the casing in which it is arranged, and also illustrating the upper swivel connection for attaching my improvements to the stern of a boat. Fig. 3 is a detail elevation, partly in section, illustrating the armature-cylinder and the commutator of the motor. Fig. 4 is a sectional view illustrating the rudder and propeller-carrying frame and the manner of connecting the same with the stern of a boat. Figs. 5 and 6 are diagrammatic views illustrating the circuits through the electric generator and electromotor, according to different manipulations of the controlling device. Fig. 7 is a detail plan view with parts in section, illustrating the electromotor in its casing, the steering-handle, and the device for controlling the motor. Fig. 8 is an inverted plan view of the motor-casing. Fig. 9 is a detail section illustrating the manner in which the tube carrying the steering-handle is connected with the casing of the motor, and Fig. 10 is an enlarged detail section taken transversely through the handle at one end of the tube in which said handle is journaled.

Referring by letters and figures to the said drawings, A indicates a boat of the ordinary or any suitable construction, and B indicates castings which are connected to the stern-post of the boat, adjacent to the upper and lower ends of the same, and are provided with vertically-disposed sleeves *a*, as shown. These sleeves *a* loosely receive pins *b c*, the upper pin *b* being connected to the under side of the motor-casing C, while the lower pin *c* is loosely connected to a screw-bolt *d*, for a purpose presently described.

D indicates a tubular rudder-post, which is fixedly connected at its upper end to the under side of the motor-casing C and is provided adjacent to its lower end with a threaded aperture *e*, which receives the screw *d*, as better shown in Fig. 4, whereby it will be seen that said rudder-post may readily be adjusted so as to rest in a vertical position irrespective of the inclination of the stern-post of the boat. The said post D is provided at its lower portion with a fixedly-connected frame-bar *f*, to which a rudder *g* is fixedly connected and between which and the post D is arranged the propeller *h*, which is fixed on a shaft *i*, journaled in the bar *f* and post D, as shown. On its end within the post D the shaft *i* is provided with a beveled pinion *j*, with which meshes a similar pinion *k* on the lower end of a vertical shaft *l*, which extends up through the post D and is provided at its upper end with a gear-wheel *m* for the engagement of a pinion *n* on the shaft *p* of the electromotor, presently described.

In virtue of the construction thus far described it will be seen that when the electromotor, presently described, is set in motion the shaft *l* will be rotated, as will also the shaft *i* and the propeller *h* thereon, and it will also be seen that when the rudder-post D is swung in either direction in the arc of a circle to

steer the boat the motor-casing and the propeller will move with it, and consequently the rotation of the propeller will not be interrupted or interfered with.

E indicates a tube of suitable metal which is designed to serve as a tiller for moving the post D and steering the boat. This tube E has one end arranged in a sleeve p' of the motor-casing and provided with a bayonet-slot q to receive a stud r, through the medium of which the tube is detachably connected to the sleeve. The tube extends laterally from the motor-casing and thence forwardly.

F indicates a handle which has a reduced portion journaled and suitably secured in the forward end of the tube E and provided with a rod s.

t indicates a shaft which rests partly within the tube E and partly within the motor-casing and is provided with suitable contacts, hereinafter described, which are insulated from each other and from the shaft, and u indicates a wire coil which is connected to the rod s and shaft t and is adapted, when the handle F is rotated or partially rotated or rocked on its axis, to transmit such movement to the shaft t for a purpose presently described.

The handle F (see Fig. 10) is provided with a finger a^7, and the tube E with stops b^7 to limit the rotation of the handle. The finger and stops are not, however, essential and may be dispensed with when desirable.

G indicates the electromotor, which is mounted upon the base-plate a' of the casing C and is arranged entirely within said casing, so as to be protected from water and dirt. This motor G differs from the ordinary well-known motors only in the compact arrangement of its organs or parts, and it comprises the magnets forming the magnetic field b', the armature c', arranged within the magnetic field and fixed on the shaft p, before described, the commutator d', arranged above the armature and magnetic field, and the brushes e', all of which are of the ordinary construction and need not, therefore, be particularly described herein.

H (see Figs. 5, 6, and 7) indicates the electric generator, of any suitable type, which may be situated at any desired point in the boat.

I J indicate blocks of insulating material which are connected to the base-plate a' of the motor-casing, the latter block extending within said casing.

1, 2, 3, 4, 5, and 6 indicate brushes connected to the block J and insulated from each other.

7, 8, 9, 10, 11, 12, 13, 14, and 15 indicate contacts on the shaft t, which are insulated from said shaft and from each other.

16 indicates a conductor connecting brush 2 and end plus pole of the generator.

17 indicates a conductor connecting end minus pole of the generator and brush 4.

18 indicates a conductor connecting an intermediate plus pole of the generator and the brush 3.

19 20 indicate the brushes of the commutator d'.

21 is a conductor between brush 1 and brush 19.

22 is a conductor between brush 20 and the brush 5.

23 is a conductor between brush 6 and the magnetic field b'.

24 is a conductor between magnetic field b' and the brush 4.

26 is an electrical connection between contacts 7 and 8.

27 is an electrical connection between contacts 9 and 10.

28 is an electrical connection between contacts 10 and 11.

29 is an electrical connection between contacts 15 and 13, and 30 is an electrical connection between contacts 14 and 12.

With the shaft t resting in a position to hold the several contacts 7 to 15, as represented in Fig. 6, the circuit will be from end plus pole of generator H, through conductor 16, brush 2, contact 10, connection 28, contact 11, brush 1, conductor 21, commutator-brush 19, commutator d', commutator-brush 20, conductor 22, brush 5, contact 7, connection 26, contact 8, brush 6, conductor 23, magnetic field b', conductor 24, brush 4, and conductor 17, to end minus pole of generator, and in consequence the motor is driven with the full power of the generator at full speed in a direction to propel the boat forwardly. If the shaft t be now partially rotated a suitable distance to carry the contact 9 into engagement with the brush 3 and the contact 10 out of engagement with the brush 2, the circuit will be from an intermediate plus pole of the generator H, through conductor 18, brush 3, contact 9, connection 27, contact 10, connection 28, contact 11, brush 1, conductor 21, commutator-brush 19, commutator d', commutator-brush 20, conductor 22, brush 5, contact 7, connection 26, contact 8, brush 6, conductor 23, magnetic field b', conductor 24, brush 4, and conductor 17, to end minus pole of generator, and in consequence the motor is driven with but part of the power of the generator at a slow speed in a direction to propel the boat forwardly.

If the shaft t be now partially rotated in the same direction as before a sufficient distance to disengage the contact 9 from brush 3, (the contact 10 being already out of engagement with brush 2,) the electrical connection with the plus poles of the battery will be interrupted, and in consequence the motor will stop. If the shaft t be now turned still farther in the same direction a sufficient distance to carry the contacts 12, 13, 14, and 15 into engagement with brushes 5, 6, 2, and 1, the current from the plus pole of the generator will pass through conductor 16, brush 2, contact 14, connection 30, contact 12, brush 5, conductor 22, commutator-brush 20, commutator

d', commutator-brush 19, conductor 21, brush 1, contact 15, connection 29, contact 13, brush 6, conductor 23, magnetic field b', conductor 24, brush D, and conductor 17 to minus pole of generator, and in consequence the direction of rotation of the armature and propeller will be reversed and the boat will be backed.

It will be observed from the foregoing that with a single hand applied to the handle F on tube E the operator is enabled by moving said handle in a horizontal plane to steer the boat, and by turning it on its axis to start the motor and operate it at full and part speed in a direction to drive the boat forwardly and also to reverse the motor so as to back the boat.

Having thus described my invention, what I claim is—

1. The combination of a boat, a post connected with the boat so as to permit of it being swung to and fro and carrying a rudder, a propeller also carried by said post, an electromotor arranged in a casing on the post and connected with the propeller, an electric generator, a switch connected with the conductors leading to the electromotor and conductors leading to the end plus and minus poles of the generator and also with a conductor leading to an intermediate pole of the generator and adapted to be manipulated so as to utilize either the full power or a fraction of the power of the generator to actuate the motor, and a handle adapted for oscillatory and rocking movements; said handle being connected with the rudder-post and also having a connection with the switch whereby, on being oscillated, it controls the steering of the boat and when rocked on its axis operates the motor-controlling switch.

2. The combination of a boat, a post connected with the boat so as to permit of it being swung to and fro and carrying a rudder, a propeller also carried by said post, a casing arranged on the post, an electromotor arranged in said casing and connected by interposed gearing with the propeller, an electric generator, electric connections between the generator and motor, a device for controlling the motor, and a handle adapted for oscillatory and rocking movements; said handle being connected with the rudder-post and also having a connection with the motor-controlling device, whereby, on being oscillated it controls the steering of the boat and when rocked operates the motor-controlling device, substantially as specified.

3. The combination of a boat, a propelling-motor, a device for controlling the same, a rudder, and a handle adapted for oscillatory and rocking movements; said handle being connected with the rudder and also having a connection with the device controlling the motor, whereby, on being oscillated, it controls the steering of the boat and when rocked operates the motor-controlling device, substantially as specified.

4. The combination of a boat, a rudder-post connected with the stern of the boat so as to permit of it being swung in the arc of a circle and carrying a rudder and a propeller, a motor-casing fixed on said rudder-post, an electromotor arranged in said casing, an electric generator, a rotary switch for controlling the electromotor, a tube connected to the motor-casing, and a rotatable or partially rotatable handle mounted on the tube and connected with the rotatable switch, substantially as specified.

5. The combination of a boat, a rudder-post connected with the stern of the boat so as to permit of it being swung in the arc of a circle and carrying a rudder and a propeller, a motor-casing fixed on said rudder-post, an electromotor arranged in said casing, a rotary switch for controlling the electromotor, a tube connected to the motor in alinement with the rotary switch, a rotatable or partially rotatable handle journaled in the tube, and a wire coil connecting the handle and the rotary switch, substantially as specified.

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

GEORGE F. ATWOOD.

Witnesses:

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THOMAS E. TURPIN.