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GENERATOR FOR MOTOR BOATS OR THE LIKE

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This invention relates to electric generators and particularly to generators for boats and the like.

The main objects of this invention are to provide an electric generator particularly adapted for use on small boats in which the engine or other source of power is not adapted to directly drive a generator; to provide an electric generator which may be readily attached to the hull of a boat below the water line and which is arranged so as to be driven by the water as the boat passes therethrough; to provide a hydro-electric generator in the form of a relatively small compact unit which will present little resistance to its passage through the water; and to provide such a device in which the generator driving impeller is fully protected from injury or from entanglement with weeds and the like.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which

Fig. 1 is a view in side elevation of an outboard motor boat equipped with my improved hydro-electric generator, a portion of the boat being broken away to more clearly show the installation.

Fig. 2 is an enlarged vertical, medial, longitudinal, sectional view of my generator mounted in a fragmentary portion of a boat hull.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2, looking in the direction indicated by the arrows.

In the construction shown in the drawings, elongated outer and inner casings 4 and 5, respectively, are integrally joined at their forward ends and are in concentrically spaced relation abaft thereof, thus providing a passageway 6 therebetween.

The inner casing 5 has an axially extending space or bore 7 therein, open at the front end, and in which is mounted an assembly of field coils 8. The rear end of the casing 5 terminates in spaced relation to the rear end of the outer casing 4, and is provided with an armature shaft bearing 9 and stuffing box 10.

A cap 11 of ogival shape is detachably secured to the front of the casings by screws 12, and serves as a closure for sealing the space 7, a suitable gasket 30 being provided between the cap and the casing to seal the joint between them. The cap 11 carries an armature shaft bearing or bushing 13 concentrically therein, in which is journaled the front end of an armature shaft 14, upon which is mounted an armature 15 within the field coils 8. The opposite end of the armature shaft 14 is journaled in the bearing 9, and projects rearwardly through the stuffing box 10.

Such projecting end is provided with an impeller 16 secured thereon by a nut 17. The impeller 16 is housed within the rear end of the outer casing 4 and a screen 18 is secured rearwardly thereof so as to protect the impeller from damage.

The forward end of the outer casing 4, immediately back of the nose cap 11, is provided with a plurality of water inlet ports 19, opening toward the side of the device rather than the front, which admit water to the annular passageway 6 for acting on the impeller 16 to rotate the same when the device is passed through the water.

Means are provided for attaching the device to the hull 20 of a boat and comprise a radially extending shank 21 integrally formed with the outer casing. The outer end of the shank is exteriorly threaded to receive a nut 22 which is screwed down on a gasket 23 interposed between the nut and the inner side of the hull through which the shank projects. This construction forms a simple and efficient means for securing the device to a boat.

Electric conductors 24 are provided in suitable passageways which extend through the shank 21 for transmitting current collected by the brush 25 which rides on the commutator 26 of the generating unit. It will be noted that in this way the conductors 24 are protected against contact with the water or with foreign objects in the water.

Current generated by the unit may be carried by the conductors 24 to a storage battery 27, if desired, and thence to a running light 28 or other desired place. A conventional type of generator cut-out 29 may be inserted between the generator and battery if desired.
In the operation of this device it is mounted on the outer side of a boat's hull below the water line. As the boat moves forwardly through the water a suction is created at the rear end of the casing, because of the shape of such end, and this suction causes a flow of water into the passageway 6 through the ports 19, and thence rearwardly out through the screen 18. Obviously, this flow of water against the impeller 16 will cause rotation thereof and a corresponding rotation of the armature 15 with consequent power output by the generator. It may be desirable, in some cases, to form a reverse curve or outward flare at the rear end of the casing, as at 31, in order to increase the suction at the rear end of the casing. It will also be apparent that the relative flow of water against the ports 19 will aid in causing the water to flow through the casing, and that scoops may be added to said flow from this cause, but I prefer to eliminate a material amount of flow by this method because of the greater possibility of clogging the ports 19 by foreign matter.

Although I show a conventional form of stuffing box 10 for sealing the rear end of the armature shaft 14, it will be obvious that any suitable form of sealing device may be employed at this point.

Normal changes may be made in the specific embodiment of the invention described without departing from the spirit and substance of the broad invention, the scope of which is commensurate with the appended claims.

I claim:

1. A hydro-electric generator comprising a casing, a current generating unit within said casing, a drive shaft for said unit having one end projecting through a stuffing box in said casing, an impeller on said projecting shaft end, said casing having a water passageway leading to said impeller for rotating the same when said unit is passed through the water, a shank on said casing for attaching said device to a boat hull, and an electric conductor passing through said shank for carrying current from said generating unit.

2. A hydro-electric generator comprising an outer casing, an inner casing in spaced relation thereto providing a water passageway therebetween, a current generating unit housed within said inner casing, a drive shaft for said unit extending into the space provided by said outer casing, and an impeller on said shaft and housed within said outer casing for driving said generator.

3. A hydro-electric generator comprising an outer casing, an inner casing in spaced relation thereto providing a water passageway therebetween, a current generating unit housed within said inner casing and sealed against the entrance of water thereinto, a drive shaft for said unit extending rearwardly into the space provided by said outer casing, and an impeller on said shaft and housed within said outer casing for driving said generator.

4. A hydro-electric generator comprising an outer casing, an inner casing in concentrically spaced relation thereto providing a water passageway therebetween, one end of said inner casing terminating in spaced relation to the rear end of said outer casing, a current generating unit housed within said inner casing, a drive shaft for said unit extending into the space provided by said outer casing, and an impeller on said shaft and housed within said outer casing for driving said generator.

5. A hydro-electric generator comprising an elongated tubular housing having water intake ports adjacent the front end thereof and the rear end thereof permitting water to be discharged therefrom, an inner casing housed within said outer casing and terminating in spaced relation to the rear end thereof, an electric generator unit sealed against the entrance of water thereinto within said inner casing, a drive shaft for said unit having one end projecting into the space at the rear end of said inner casing, and an impeller on said projecting shaft end for driving said unit, said impeller being housed within said outer casing.

6. A hydro-electric generator comprising an outer casing, an inner casing in spaced relation thereto providing a water passageway therebetween, a current generating unit housed within said inner casing, a drive shaft for said unit extending into the space provided by said outer casing, and an impeller on said shaft and housed within said outer casing for driving said generator, a shank projecting from said outer casing for attaching said device to a boat hull, and electric conductors passing through said shank for carrying current from said current generating unit.

7. A hydro-electric generator comprising elongated inner and outer casings in concentrically spaced relation to provide a water passageway therebetween, said inner casing having an axially extending space open at the front end thereof, field coils mounted within said space, an armature shaft bearing and stuffing box at the rear end of said inner casing, a detachable cap for closing the front end of said space, an armature shaft bearing mounted in said cap, an armature shaft journal in said bearings with the rear end projecting beyond said stuffing box, an armature on said shaft within said field coils, and an impeller on said projecting shaft end for rotating said armature, said outer casing having a port therein for admitting water.
to said passageway for driving said impeller.

8. In a generator for boats, in combination, a hollow casing having a streamlined nose and an open rear end, a water tight compartment within said casing spaced radially inwardly from the inner walls thereof, an electric generator within said compartment having a shaft, said shaft projecting rearwardly out of said compartment, and an impeller secured to said shaft between said compartment and the rear edge of said casing, said casing having ports in the nose portion thereof of rearwardly of the point of said nose for admitting water into the space between said compartment and the inner walls of said casing.

9. In a generator for boats, in combination, a hollow casing having a streamlined nose and an open rear end, a water tight compartment within said casing spaced radially inwardly from the inner walls thereof, an electric generator within said shaft projecting rearwardly out of said compartment, an impeller secured to said shaft between said compartment and the rear edge of said casing, said casing having ports in the nose portion thereof, for admitting water into the space between said compartment and the inner walls of said casing, and the outer walls of said casing adjacent the rear end thereof being outwardly curved to effect a greater suction on said rear end during passage of said casing through water.

10. An electric power generating unit for boats, comprising a generally cylindrical hollow outer casing having a substantially pointed nose portion, a generating unit within said casing sealed against the entrance of water and providing a water passage between it and said casing, said casing having water passages connecting said space with the exterior surface thereof at a point removed from the extreme tip of said nose portion, a drive shaft projecting from one end of said generating unit, and a propeller secured to said shaft within the protection of said casing and exposed to the flow of water therethrough.

11. In an electric power generating unit for boats, a pair of generally spaced casing members one located within the other, the space between said members forming a water passage, a generating unit housed within the inner of said housings and sealed against the entrance of water thereinto, a shaft for said unit projecting out of said inner casing, a propeller secured to said shaft externally of said inner casing but internally of the outer of said casings, and a nose portion for said outer casing, said outer casing being open at the rear end thereof and having intake openings adjacent the forward end thereof exposed primarily on the side faces of said outer casing.

12. In an electric power generating unit for boats, a pair of generally spaced casing members one located within the other, the space between said members forming a water passage, a generating unit housed within the inner of said housings and sealed against the entrance of water thereinto, a shaft for said unit projecting out of said inner casing, a propeller secured to said shaft externally of said inner casing but internally of the outer of said casings, a nose portion for said outer casing, said outer casing being open at the rear end thereof and having intake openings adjacent the forward end thereof exposed primarily on the side faces of said outer casing.