

C. E. EDWARDS.
 PROPELLING MECHANISM,
 APPLICATION FILED SEPT. 8, 1910.

989,769.

Patented Apr. 18, 1911.

Fig. 1.

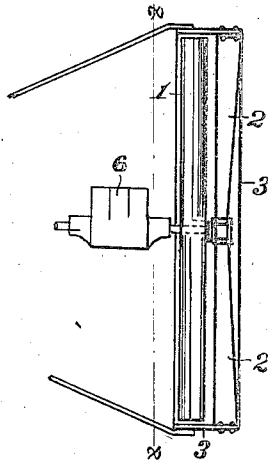


Fig. 2.

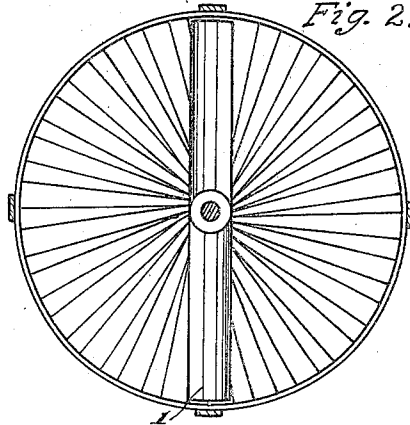


Fig. 3.

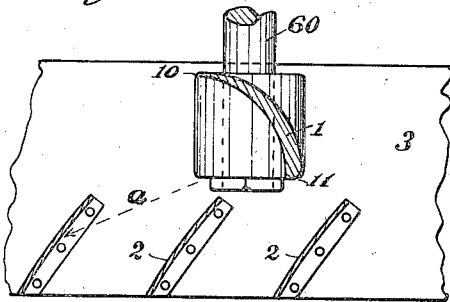


Fig. 5.

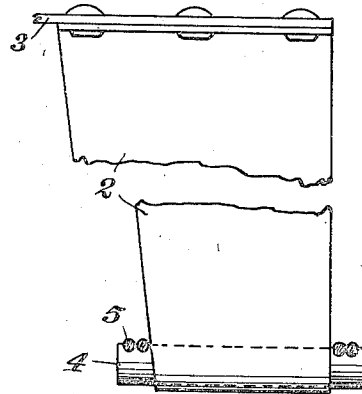
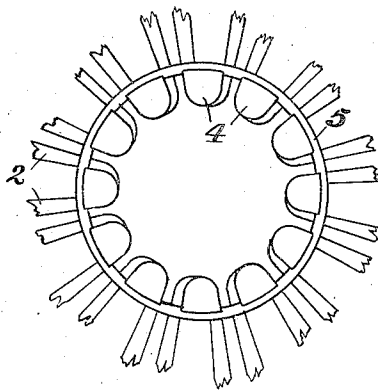


Fig. 4.



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PROPELLING MECHANISM.

989,769.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES E. EDWARDS, a citizen of the United States, residing at Everett, in the county of Snohomish, State of Washington, have invented a new and useful Improvement in Propelling Mechanisms, of which the following is a specification.

My invention relates to propelling mechanisms adapted for use in fluids, and comprises certain novel parts and combinations which will be more fully pointed out and defined.

The object of my invention is to produce an improved form of propelling mechanism, and one in which the revolving propeller is not the only propulsive member, but in which the discharge from the revolving wheel is received upon inclined blades or surfaces which are placed at such an angle that this discharge acts thereon to propel the body carrying them in the same direction as does the revolving wheel.

In the drawings accompanying this specification I have shown, in simple form, a preferred mechanism illustrating the principles of my invention and the manner in which I may secure the desired results.

Figure 1 is a side sectional elevation of the propelling members. Fig. 2 is a front face view or elevation. Fig. 3 is a sectional detail showing the relative angular positions of the revolving and stationary blades and the manner of impact of the fluid upon the latter. Fig. 4 is a detail showing the construction of the hub or center of the stationary wheel. Fig. 5 is a detail showing the manner of securing the stationary blades to the rim and to the central hub.

I have discovered that by using a propeller of such shape that the fluid in which it works will be given a considerable gyratory or rotative effect, and then placing in the discharge from this propeller, a series of blades set at proper angle so as to act as sails, these latter blades will add very greatly to the propulsive effect. The action of these latter blades, which are non-rotative, is identical in principle with the action of the sails of a vessel which is beating closely into the wind.

I have, up to the present, employed my invention mainly in air, although I have used it somewhat in water. I believe it, however, to be most suited to use in air and will so describe it without, however, thereby

meaning to imply that it may not be used in water. The fluid in which it is used may be either gaseous or liquid.

The device consists of two principal parts which coöperate to produce the improved effect, namely: the propeller or equivalent means acting upon the air or fluid to give it gyratory or rotative action, and preferably also producing a propulsive effect; and with this set of non-rotative inclined surfaces, sails or blades, set at such an angle as to receive the fluid discharged from the revolving wheel or propeller, at such an angle as to act like a sail to produce a propulsive effect in a direction making a relatively slight angle with that of the movement of the fluid and in apparent opposition thereto.

I have shown as the means for acting upon the air to give it the proper gyratory action, a propeller wheel 1, which may be of any approved form and turned by any convenient means, except as particularly otherwise pointed out. As shown this propeller is supposed to have two blades. These blades are shaped somewhat differently from the form which is most generally accepted as the best form for a propeller. In Fig. 3 one of these blades is shown in cross section. This shows that the advancing edge 10, is inclined so as to sharply cut the air, being rather closely approximating in its direction to a plane which is normal to the axis of revolution.

The rear or following edge 11, of the propeller blade is, on the contrary, closely approximating in its direction, with that of an axial plane, the surface between these edges being curved so as to smoothly trend into these different angles. This makes the acting or driving-face of the propeller blades deeply concaved, whereby they act to drive the air rearwardly and also to give it a considerable gyratory or rotative effect. The rearward movement of the air produces a reactive forward-driving effect. The rotative or gyratory movement of the air thus produced causes it to impinge upon the inclined, non-rotative or fixed blades 2, after the manner indicated by the dotted line *a* in Fig. 3, acting upon these as sails to produce a forward propulsive effect. The air discharged from the wheel 1 acts upon the surface of the blades 2 which is farthest from the wheel, but at such angle as to pull them forward. These stationary blades I prefer to make in the form of a wheel which is lo-

cated close behind the revolving wheel 1. To prevent peripheral discharge of the air without its exerting its full effect upon the blades 2, I prefer to inclose these blades within a rim 3. As shown, these blades are riveted or otherwise secured to the rim by their ends, their middle portion being bent about a bar 4 of the hub which extends somewhat in an axial direction, the two ends of the same piece thus forming two consecutive blades.

The hub consists of a series of the bars 4 and binding rings 5. The rings 5 should be sufficiently small to place the blades under tension. The bars 4 are preferably provided with grooves in their outer ends, on one side, to receive the rings 5. This construction makes a hub having a clear opening in its center.

The propeller wheel 1, I have shown as connected with an explosive engine 6, which would probably be the preferred source of energy in most cases. This may, however, be anything which is most available and adaptable.

The rotation of an ordinary propeller wheel produces a rotative effect or torque upon the structure carrying it. In using my device a similar torque, but in an opposite direction, is produced by the action of the discharge upon the stationary blades 2.

The resultant of these two effects is zero, one counterbalancing the other, wherefore, my device may be used upon aeroplanes or other structures without producing thereon any of this rotative effect.

I have found that by using this form of device the same expenditure of power produces a greater driving effect than can be produced by the use of a propeller alone, the latter being of the most accepted design and proportion.

I claim:

1. A propelling wheel comprising a rim, a central hub having bars extending in a general axial direction, and a series of blades having their ends secured to the rim in an angular position, and the middle portion of each passing about one of the bars of the hub.

2. A propelling wheel comprising a rim, a hub consisting of a series of bars extending in a general axial direction and rims inclosing said bars, and blades having their ends secured to the rim in an angular position and their middle portion passing about the bars of the hub.

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Witnesses:

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