

1,033,476.

Patented July 23, 1912.

Fig. 1.

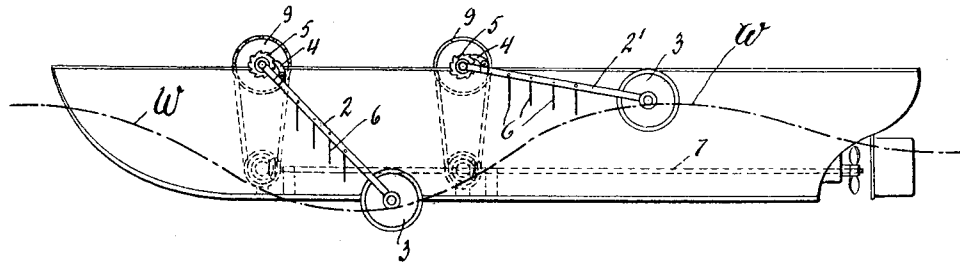


Fig. 2.

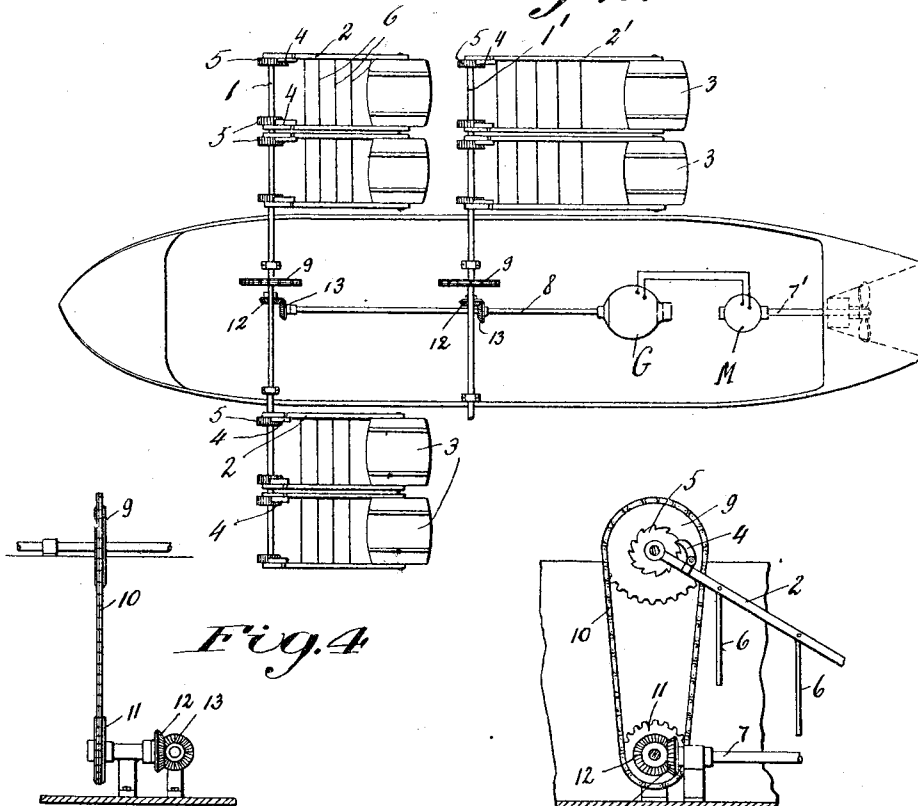


Fig. 4.

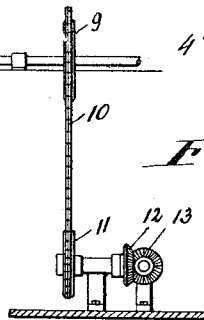


Fig. 3.

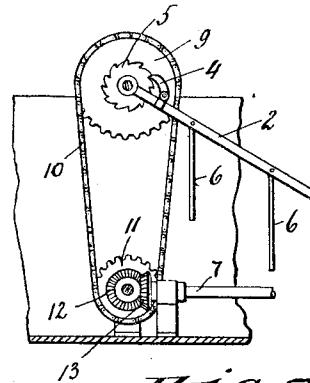
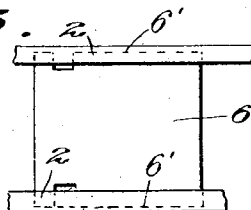


Fig. 5.



Witnesses:
Harry C. Hebig
R. Brockman.

Inventor
Otto Schulze
By his Attorney
Max V. Debus

UNITED STATES PATENT OFFICE.

OTTO SCHULZE, OF BROOKLYN, NEW YORK.

WAVE-MOTOR.

1,033,476.

Specification of Letters Patent.

Patented July 23, 1912.

Application filed January 5, 1911. Serial No. 600,892.

To all whom it may concern:

Be it known that I, OTTO SCHULZE, a subject of the German Emperor, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Wave-Motors, of which the following is a specification.

The present invention relates to that class of wave motors in which the wave power is utilized through the operation of a swinging lever carrying a buoyant body and the object of my invention is to utilize the wave power for propelling a vessel or the like, or for converting the wave power into and storing up electricity in a vessel, airship, etc., to be subsequently used for various purposes.

I accomplish my object by the mechanism described herein and illustrated in the accompanying drawing, in which similar reference letters denote corresponding parts and in which—

Figure 1 is a side view of a vessel and the wave motor applied thereto and means for transmitting movement from said motor directly to a propeller shaft; Fig. 2 is a plan view thereof, showing means for converting the wave power into electricity and of means for driving the propeller shaft by the latter; Figs. 3 and 4 are enlarged views at a right angle to one another of transmission means from the wave motor to the propeller shaft or the shaft of an electric generator and Fig. 5 is an enlarged plan view of the wings.

In the drawing, which forms a part of this specification, I have illustrated by way of example, an ordinary boat or vessel.

1, 1' denote spindles extending transversely to and suitably borne in the body of the vessel and upon the ends of which levers 2, 2' are mounted, so as to be capable of swinging in vertical direction. Each spindle may carry a number of such levers on each side of the vessel. In the example shown, each spindle carries on each side of the vessel two levers and each lever is composed of a pair of arms, the free ends of which carry a barrel-shaped air receptacle 3, which forms the buoyant body. The opposite ends of these arms, which are rotatively borne on the spindles 1, 1', carry pawls 4 adapted to cooperate with ratchet wheels 5 fixed on the spindles. Pivotaly secured in the arms of each lever are a number of flaps or wings 6, which are arranged behind

one another and which normally by their own weight will swing down into a perpendicular position, as shown in Fig. 1. These wings or flaps, however, are adapted to be limited in their swinging movement by their lateral edges 6' engaging the lower edges of the lever arms 2, 2' or by any suitable means, so that when swung upward to the limit of their movement, they will form a resistance to the wave, in consequence of which the levers 2, 2' will be given a swinging movement.

As the waves W roll longitudinally to the vessel, they carry the float or buoyant body along with them, as indicated at the right of Fig. 1, until the wave passes out from under the float, when the power lever will swing back to be engaged by the next wave. By this upward movement of the levers received through the wave, the pawls on the corresponding levers will feed the ratchet wheels, thereby imparting an intermittent rotation to the corresponding spindles 1, 1'. During the downward movement of the lever, the pawls will idly slide over the teeth of their corresponding ratchet wheels without affecting the latter nor the spindles.

If the waves run so high as to be liable to attack the lever at a point higher than the float, the wings or flaps will come into operation, by being swung upward to the limit of their movement and forming thereby a resistance to the waves, in consequence of which the levers will be swung upward, as in the first case, and cause the feeding of the ratchet wheels by their pawls. This intermittent rotary movement thus received by the spindles owing to the swinging movement imparted to the levers by the waves either through the float or the flaps or wings may be utilized in various ways. One way is to transmit this movement to the propeller shaft 7 directly as shown in Fig. 1. Another way is to transmit this rotary motion to the shaft of an electric generator G, so as to convert the wave power into electricity and to store up the electricity to be made use of for various purposes, as, for instance, for driving an electric motor M, from which the propeller shaft 7' may be driven, as shown in Fig. 2, for lighting purposes, etc.

The transmission of movement from the spindle 1, 1' to the propeller shaft 7 or shaft 8 of the electric generator G may be accomplished in various ways. In the present ex-

ample, I have shown a sprocket wheel 9 fixed on each of the spindles 1, 1', which by an endless chain 10 is connected to a smaller wheel 11 suitably borne in the vessel. From this wheel 11 by gears 12, 13 movement is transmitted to the shaft 7 or 8 as the case may be (Figs. 3, 4).

The advantages that may be derived from the utilization of the wave power in the manner described are obvious. A vessel may by the above described mechanism be caused to convert the wave power into and store up electricity during night time or in stormy weathers, to be subsequently used for various purposes. In the same manner, a ship while anchored, may have electricity generated.

What I claim and desire to secure by Letters Patent is:

1. The combination with a vessel, of a swinging member supported therein, flaps or wings pivotally supported in said swinging member and capable of turning a limited extent in vertical direction, said flaps or wings being adapted at the limits of their turning movement to form resistances to the waves so as to cause the said member to swing upward and means for transforming the swinging movement of the said member into a rotary motion.

2. The combination with a vessel, of cross spindles borne therein, levers rotatively mounted on said spindles, flaps or wings carried by said levers capable of swinging to a limited extent in vertical direction and adapted at the limit of their swinging movement to form resistances to the waves, so as to cause the levers to swing upward and means for transforming said swinging movement of the levers into a rotary motion of said spindles.

3. The combination with a vessel, of a swinging member carrying a buoyant body

and supported in said vessel, flaps or wings pivotally supported in said swinging member and capable of turning a limited extent in vertical direction, said flaps or wings being adapted at the limit of their turning movement to form resistances to the waves so as to cause the said member to swing upward and means for transforming the swinging movement of the said member into a rotary motion.

4. The combination with a vessel, of spindles supported therein, levers rotatively mounted on said spindles, flaps or wings pivotally supported in said levers and capable of turning a limited extent in vertical direction, said flaps or wings being adapted at the limit of their turning movement to form resistances to the waves so as to cause the said levers to swing upward and means for transforming the swinging movement of the said levers into a rotary motion.

5. The combination with a vessel, of spindles supported therein, a pair of levers rotatively mounted on each spindle, a buoyant body carried in the free ends of each pair of levers, a series of flaps or wings arranged crosswise to the levers one above the other and pivotally supported therein, said flaps or wings being capable of turning only a limited extent in vertical direction and at the limit of their movement to be acted upon by the waves and cause the swinging of said levers, and means for transforming the swinging movement of the said levers into a rotary motion.

In testimony whereof I affix my signature in presence of two witnesses.

OTTO SCHULZE.

Witnesses:

CHARLES KAISER,
WILLIAM H. BOURNE.