June 23, 1931. S. I. SCHWABACHER 1,811,565

WAVE MOTOR

Filed July 22, 1929

Fig. 1.

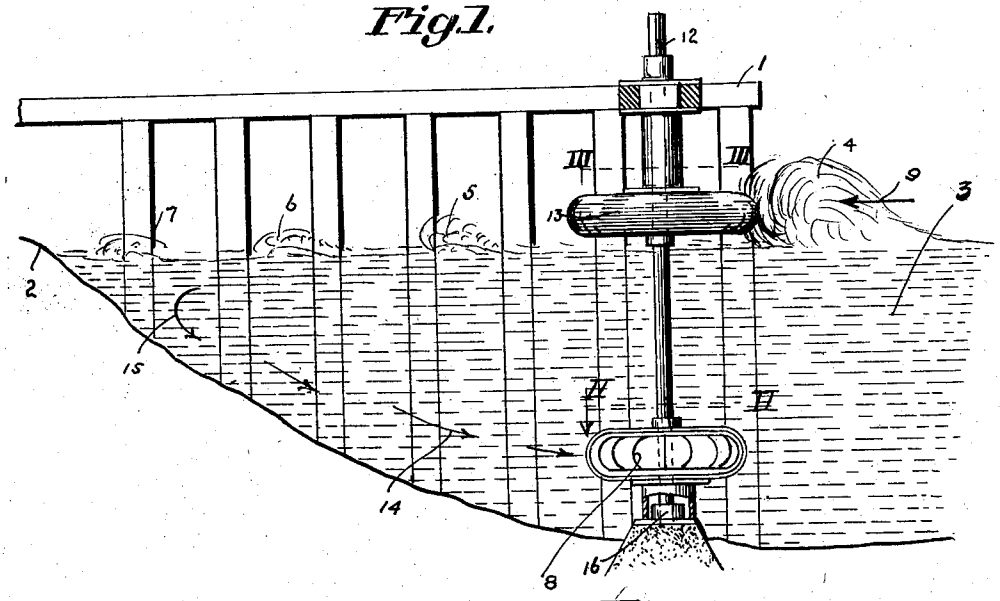


Fig. 2.

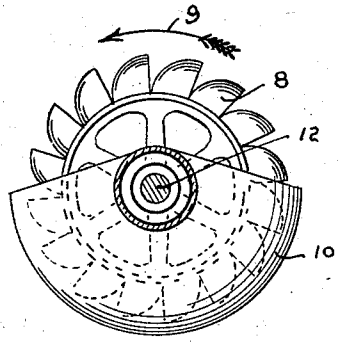
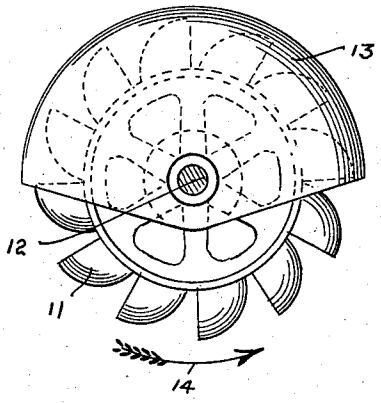


Fig. 3.



Inventor.
Sam I. Schwabacher

By George J. Sears
Attorney.

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UNITED STATES PATENT OFFICE

SAM I. SCHWABACHER, OF SAN FRANCISCO, CALIFORNIA

WAVE MOTOR

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My invention has for its object apparatus for transforming the energy of moving waves into mechanical power.

A further object is apparatus for transforming energy of moving waves and the under current adjacent to the shore and resulting therefrom, into mechanical power.

A further object is in apparatus of the character described a plurality of impellers mounted on the same shaft and adapted to utilize the impelling force of a fluid in one direction and in the opposite direction respectively, and to secure on the shaft the sum of their respective rotative efforts.

Other objects will appear from the drawings and specification which follow:

By referring to the accompanying drawings, my invention will be made clear.

Fig. 1 is a side view of one form of my apparatus.

Fig. 2 is a horizontal section on the line II—II of Fig. 1.

Fig. 3 is a horizontal section on the line III—III of Fig. 1.

Throughout the figures similar numerals refer to identical parts.

Any conventional structure from which my apparatus is adapted to be supported is indicated by the numeral 1, and a shore line by the numeral 2.

A cross section of the ocean is indicated at 3 and a wave about to expend itself upon my apparatus at 4.

Other waves are shown at 5, 6, 7 respectively, which have expended themselves against one of the impellers 11, of my apparatus, where they have impinged against the buckets in the direction as shown by the arrow 9 of Fig. 1, the opposite side of the impeller being shielded from the wave action by the member 13.

The impellers 8 and 11 are mounted upon the shaft 12 and the impeller 8 is provided with a shield member at 10.

It will be noted that the buckets of the impeller 11 are turned to receive the impulses of approaching waves as 4 in the direction of the arrow 9, whereas the buckets of the impeller 8 are turned in the opposite direction and adapted to receive a driving impulse from the undertow adjacent the shore 2, in the direction of the arrows 14, so that the shaft 12 is driven by the combined power generated from the buckets of the impeller 11 driven by the waves or water currents adjacent the surface of the body of water 3, and the undertow which, although approaching from the opposite direction, as indicated by the arrows 14, acts upon the opposite side of the impeller 8 and therefore produces a rotative effort in the same direction on the shaft 12. The shields 13 and 10 respectively, protecting the opposite portions of the impellers from the impulsive action of the moving fluid.

The shaft 12 may be connected to any apparatus it is desired to drive, or the power may be taken thereoff by conventional pulleys, gears, or the like, to suit the requirements of any particular installation, many such devices being well known and therefore not shown.

The shaft 12 is preferably supported at its lower end in the step bearing 16.

The operation is as follows:

The wave 9 approaching the shore 2, is shielded on one side from driving the impeller 11, while the opposite side of the impeller receives the full wave impulse in the direction of the arrow 9.

It is of course understood that only a fragmentary portion of each wave expends itself upon the buckets of the impeller, the remaining portion of the wave advancing as at 5, 6, 7 respectively, to the shore 2 and turning as at 15 to establish the undertow in the direction of the arrow 14, the impulse of which is shielded from the impeller 8 on one side by the shield 10, the other side of the impeller receiving the full impulse of the undertow causes the rotation of the said impeller.

Due to the eddy current losses and the difference in cross sectional area of the wave portion of the body of water and the undertow portion of the body of water, the velocity of the undertow current will usually be less than that of the approaching waves and it will be noted that my impeller 8 adapted to receive the undertow impulse, is of less diam-

eter than the impeller 11 adapted to receive the wave impulse, whereby the rotative impulse contributed by each of the runners to the shaft 12 will be the same.

In other words, the smaller diameter runner driven at the reduced peripheral velocity of the undertow will contribute the same rotative velocity to the shaft 12 as the larger diameter runner driven by the greater velocity of the waves.

I claim:

1. A wave motor comprising a framework adapted to be supported on an ocean bed, a vertically disposed shaft journalled in said framework, a first impeller on said shaft adapted to be actuated by the advancing waves of the ocean whereby said shaft is rotated in a predetermined direction, and a second impeller of less diameter than said first impeller on said shaft and adapted to be actuated by the receding waves of the ocean whereby said shaft is rotated in said direction.

2. A wave motor comprising a framework adapted to be supported on an ocean bed, a vertically disposed shaft journalled in said framework, a first impeller on said shaft, a second impeller on said shaft and below said first impeller; said impellers being of different diameters and being adapted to be actuated by the waves of the ocean whereby said shaft is rotated in a predetermined direction, a shield on said first impeller to prevent actuation thereof by the receding waves of the ocean, and a shield on said second impeller to prevent actuation thereof by the advancing waves of the ocean.

SAM I. SCHWABACHER.