

No. 680,833.

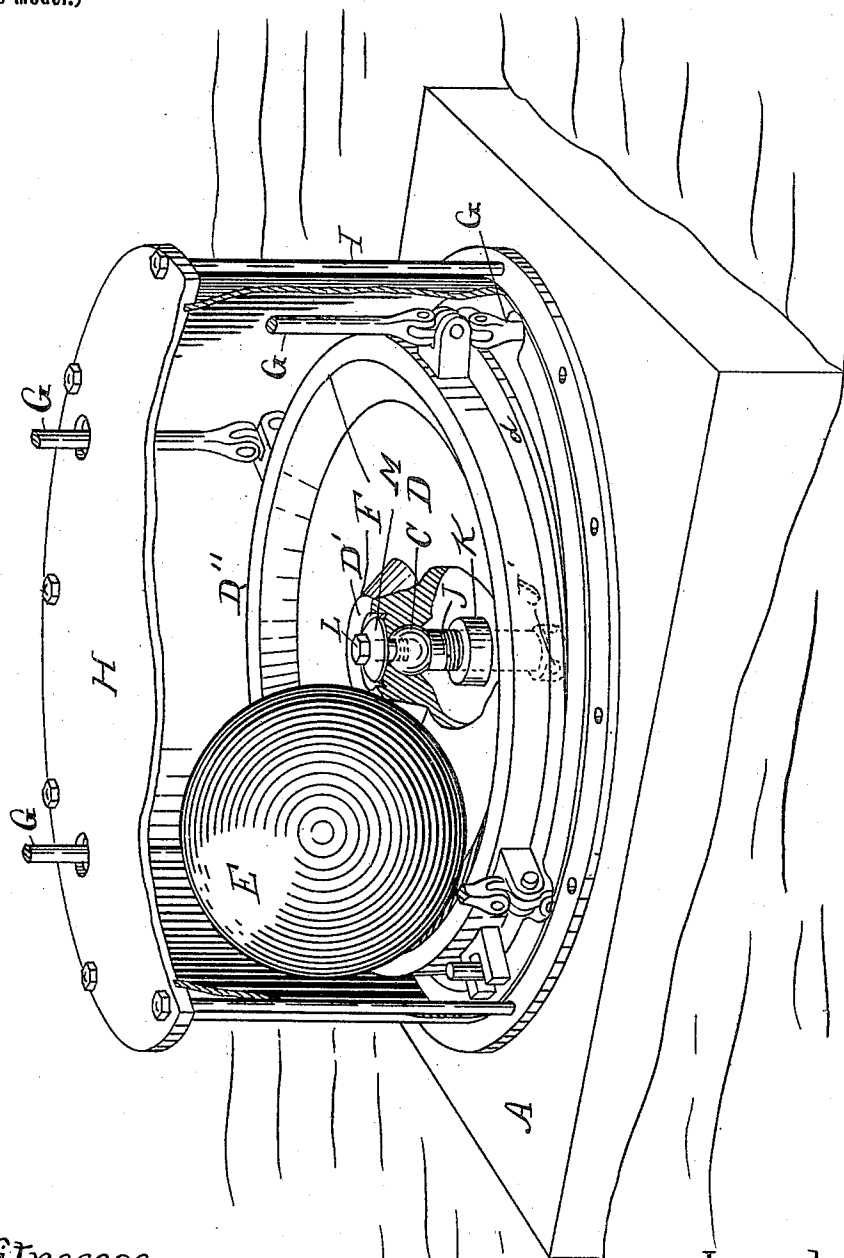
Patented Aug. 20, 1901.

H. BANNING & F. C. CAREY.

WAVE MOTOR.

(Application filed Jan. 2, 1901.)

(No Model.)



Witnesses

Harry A. Brooks

Mrs. J. W. Kirwin

Inventors.

Hancock Banning
Frank C. Carey

By

Hazard & Harpham

Attorneys

UNITED STATES PATENT OFFICE.

HANCOCK BANNING AND FRANK C. CAREY, OF LOS ANGELES, CALIFORNIA.

WAVE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 680,833, dated August 20, 1901.

Application filed January 2, 1901. Serial No. 41,875. (No model.)

To all whom it may concern:

Be it known that we, HANCOCK BANNING and FRANK C. CAREY, citizens of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented new and useful Improvements in Wave-Motors, of which the following is a specification.

Our invention relates to that class of wave-motors in which power is obtained by means of a rolling weight carried in a floating vessel, the weight being caused to roll from point to point in the vessel as the vessel assumes different positions caused by the motion of the waves; and the object thereof is to provide a simple and inexpensive mechanism that will utilize the power generated by the waves, this invention being an improvement on our wave-motor described in our application for a patent filed in the United States Patent Office September 15, 1900, and bearing Serial No. 30,166. We accomplish this object by the mechanism described herein, and illustrated in the accompanying drawing, forming a part hereof, which is a perspective view of our wave-motor partly broken away.

In the drawing, A represents the floating vessel, in which is mounted on the universal pivot C a saucer-shaped receptacle D, having an elevated central portion D', which elevated portion and the rim D'' of the receptacle form a runway for the ball, the upper inner edges F of which engage the ball and support it, the ball not being permitted to have any other support, except along these edges, the bottom not touching. Pivotaly attached to the outer edge of the receptacle are the operating-rods G, adapted to operate pumps (not shown) disposed in the vessel or bells (not shown) on the top thereof.

In the operation of our device the vessel is placed in a body of water subject to wave motion. Whenever either side or end of the vessel is raised by the action of the wave, the ball in the receptacle immediately rolls to the lowest point thereof, thereby depressing it on that side until the flange d on the receptacle contacts with the surrounding frame of the vessel in which it is mounted.

We have found by experiment that if there is no central elevated portion in the receptacle, as in the device for which we have

heretofore applied for patent, that the weighted ball will often roll directly across the receptacle and will acquire such momentum thereby that it is very likely to break something or capsize the vessel when its motion is arrested. More especially is this the case if the ball is pretty heavy; but by having a circular runway, as in the device herein described, and confining the ball therein the objection above mentioned is removed, as the ball simply moves by the depressed point and immediately returns thereto, there being no point at which a dead stop is required. Another difference which we particularly desire to point out wherein this device differs from our other device is that in this device we have provided two bearing-points F, on which the ball must rest or travel. This will obviate any friction caused by sliding parts, which would be the case if the ball engaged the sides at the same time it was rolling on the bottom. This ball is prevented from jumping out of the runway by the cover H, which is securely bolted to the frame of the vessel by bolts I or other equivalent means.

We have provided means to elevate or depress the receptacle in the surrounding frame which limits its motion when it is desired to increase or decrease the movement of the receptacle in the frame. This is done by turning the screw-threaded pivot-support J, working in the screw-threaded bearing K, rigidly affixed to the supporting-frame, holes J' being provided in the support to receive a lever by which to turn the support. To prevent the receptacle from jumping up at the side opposite to which the ball may quickly roll and to keep the same always down in proper position on the pivot, we have provided the lag-screw L, which is securely screwed into the pivot, and below the head of the bolt we have placed a washer M, the opening in the elevated central part of the receptacle to receive this washer being ample to permit a free movement of the receptacle on the pivot and at the same time prevent any part of the receptacle moving away from the pivot.

We have shown our device adapted to operate pumps to raise water or compress air, as we deem that method best adapted for the utilization of the power generated; but it is

obvious that there are other ways in which a weighted ball rolling around the outer edge of the receptacle may be utilized for power purposes.

5 Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A wave-motor comprising a vessel; a saucer-shaped receptacle, pivotally mounted
10 in the center thereof, and having a central elevated portion; a globular weight in said receptacle, adapted to roll around therein; and means, substantially as shown, to utilize the power generated.

15 2. The herein-described wave-motor, comprising a floating vessel A, adapted to be tilted about on the waves; the saucer-shaped receptacle D, having ball-supporting rims F in the center and around the rim thereof to
20 form a runway for the ball, the said receptacle being pivotally mounted in said vessel, and having a limited movement therein; a rolling weight E in said receptacle, adapted to roll around in the runway therein; said re-
25 ceptacle being operatively connected with pumps in the vessel, whereby the tilting movement of the vessel, caused by the waves, will operate the pumps.

3. A device to utilize the power of the
30 waves, comprising a vessel, adapted to be moored in water, subject to wave motion, and to have a free movement therein; a saucer-shaped receptacle arranged to have a free tilting movement therein, and being provided
35 with a runway for a rolling weight; a spherical rolling weight in said receptacle, adapted to roll around in the runway; connecting-rods pivotally secured to the rim of the re-
40 ceptacle at one end, and pivotally connected with the piston of a pump at the other end, whereby any movement of the receptacle, different from that of the vessel, will operate the pumps.

4. In a wave-motor, of the character here-
in described, the herein-described means to
45 elevate or depress the receptacle, comprising the central pivot-support J, carrying at its upper end the spherical pivot C; the said sup-
port being provided with threads to engage
50 the screw-threaded nut K; the nut K rigidly affixed to the frame of the vessel; and the re-
ceptacle D being provided with means to en-
gage the pivot in its center, substantially as
shown and described.

5. In a wave-motor, of the character here-
in described, means to permit a tilting mo-
55 tion of the receptacle in the floating frame; and to hold said receptacle in engagement with the supporting-pivot, comprising the
60 pivot C, having a vertical adjustment in the frame, and being provided with a lag-screw L, and washer M on said screw; the recep-
65 tacle D, having an opening in the center to receive a lag-screw, and having recessed bearings for the washer thereon, substantially as
shown and described.

6. In a wave-motor, the herein-described
saucer-shaped receptacle pivoted in a floating
vessel, and being provided with a central
70 elevated portion, having a ball-bearing rim on its outer and upper face; the said recep-
75 tacle being also provided with an outer rim on the inner and upper face of which is an edge forming an outer bearing for the ball,
the said receptacle having a limited tilting
movement therein, and a ball-weight in said
receptacle, adapted to roll freely around on
the said bearings.

In witness that we claim the foregoing we
have hereunto subscribed our names this 24th
80 day of December, 1900.

HANCOCK BANNING.
FRANK C. CAREY.

Witnesses:

G. E. HARPHAM,
M. A. BERNE.