(No Model.)

T. C. NARAMORE.

WAVE MOTOR.

No. 428,283. Patented May 20, 1890.

Fig. 1

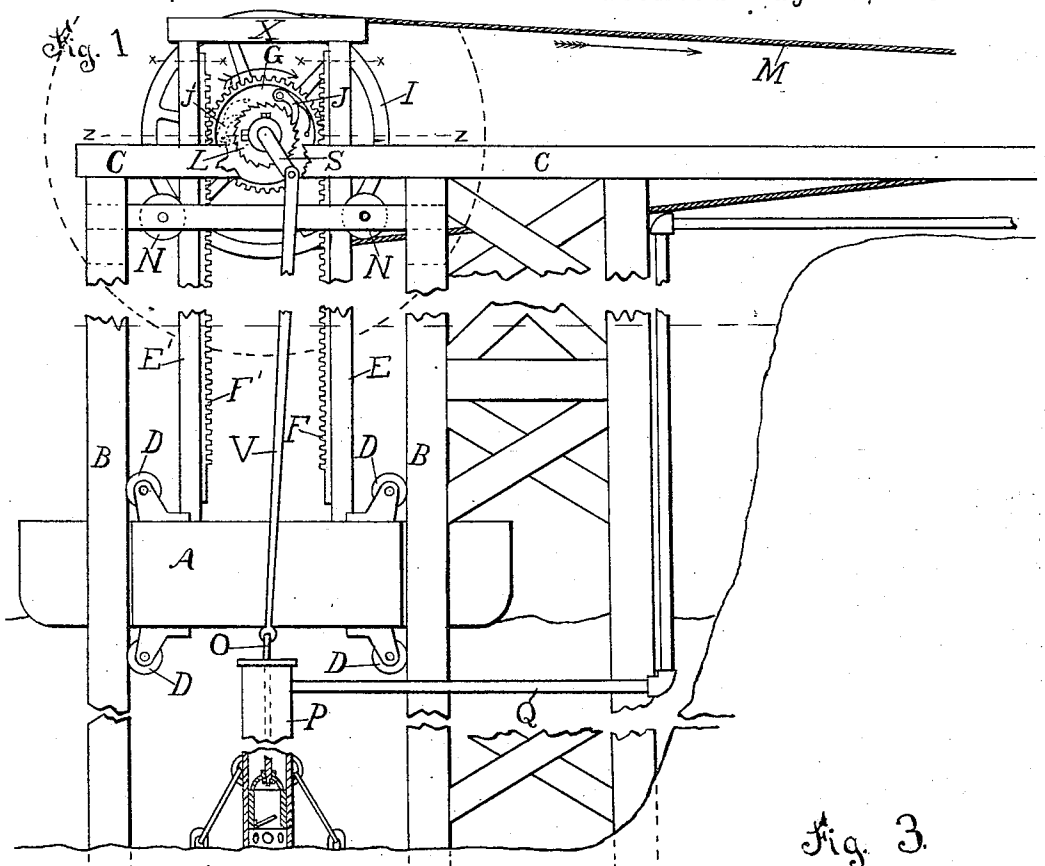


Fig. 2

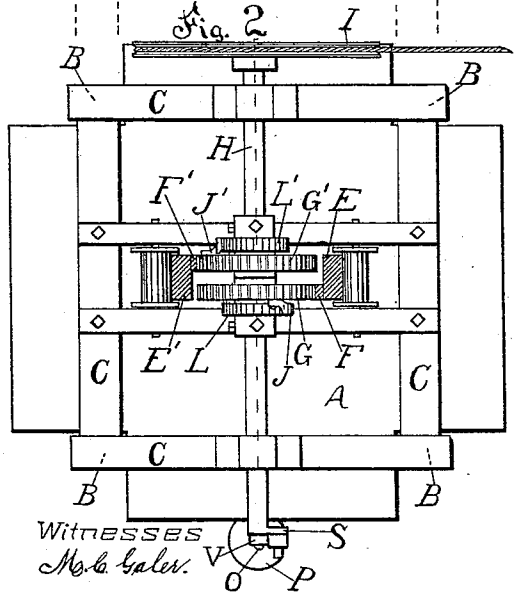
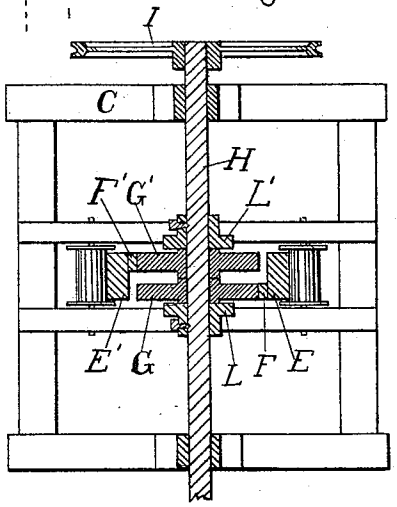


Fig. 3.



Witnesses
M. C. Galer.
E. W. Taylor

Inventor
Truman C. Naramore
by Hazard & Townsend
his Attys.

UNITED STATES PATENT OFFICE.

TRUMAN C. NARAMORE, OF LOS ANGELES, CALIFORNIA.

WAVE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 428,283, dated May 20, 1890.

Application filed September 3, 1889. Serial No. 322,829. (No model.)

To all whom it may concern:

Be it known that I, TRUMAN C. NARAMORE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Wave-Motors, of which the following is a specification.

The difficulties to be overcome in this class of inventions arise from the variations of tide and the unequal height of waves.

The purpose of my invention is to provide means for receiving the power of the waves constantly throughout the full extent of the highest and lowest waves, during storm and calm, in high and low tide, and transmitting it to machinery with an approximately constant motion, and to do this by means of simple and inexpensive machinery.

The accompanying drawings illustrate my invention, it being intended in practice to employ a number of like devices in connection with each other, so that while one float is on the crest of the wave others will be rising or falling.

Figure 1 is a plain side elevation. Fig. 2 is a plan, the cap-beam X being cut away to expose the cogs. X X, Fig. 1, shows the line of section. Fig. 3 is a horizontal section on line Z Z of Fig. 1.

A is a vertically-reciprocating float of suitable size, held in place by piling B, which form the supports of frame C, which supports the motion-converting mechanism. Anti-friction rollers D are secured to the float and arranged to engage with the piles B, which form vertical guideways therefor, so that the float is prevented from deflection from a vertical course and is allowed free vertical movement. Two vertical standards E E′ are fixed to and project upward from the float to such a height as may be requisite for the free movement and operation of the float during high and low tide and in calm and stormy weather. Upon the opposing faces of the standards E E′ are two vertical fixed racks F F′, arranged to engage, respectively, with two loose cog-wheels G G′, mounted upon a common shaft H, journaled to revolve and provided with the driving-wheel I fixed thereon. Each cog-wheel is provided with a pawl pivoted thereto and arranged to engage with a ratchet-wheel fixed upon the shaft H. When ratchet-wheel L and pawl J engage with each other, ratchet-wheel L′ and pawl J′ are free, and while L′ and J′ engage L and J are free. When the float falls, the rack F operates to rotate cog-wheel G in the direction of the curved arrow in Fig. 1. The pawl J engages with the ratchet L and operates it to rotate the shaft H to drive wheel I, which is provided with belt or cable M to transmit the power to the machinery to be operated. The ratchet F′ operates to rotate cog-wheel G′ in the direction opposite that indicated by the curved arrow, and the pawl J′ slips over the teeth of its wheel L′ until the upstroke begins. The rack F then rotates cog G in a direction opposite to that indicated by the curved arrow, and pawl J runs free over the ratchet L, while rack F′ rotates cog-wheel G′ in the direction of the curved arrow, and the pawl J′ engages its ratchet L′ and operates it to rotate the shaft in the same direction in which it is rotated by the pawl J on the downward stroke. By this means the shaft H is rotated in the direction of the curved arrow at both the up and the down stroke of the waves. The buoyancy of the float propels the machinery during the upstroke and the weight of the float propels it during the downstroke. The momentum of the wheel I and the machinery operated thereby will tend to cause rotation of shaft H to continue during the intervals between the up and down strokes; but the shaft H is left free by the pawls to rotate in the direction of the curved arrow in Fig. 1 without operating the cog-wheels, so that there is no danger of breakage caused by difference between the speed of the wheels and that of the machinery.

Anti-friction rollers N are arranged to engage with the rack timbers or standards E E′ to brace the top thereof and hold the standards perpendicular.

The wheel I is preferably of large diameter, so that the motion transmitted by the belt or cable M may be rapid. The dotted broken circle in Fig. 1 suggests a more desirable size than that shown.

A submerged water-pump P is located near the float, and the piston O of the pump is connected with a crank S on shaft H by means

of pitman V. The cylinder P of the pump is securely anchored to the bottom of the sea. The rise and fall of the float is thus caused to operate the pump to force water through pipe Q to some suitable elevated reservoir, from which the water can be drawn to assist in operating the machinery in case of a calm, and also to supply power for producing a continuous motion during the intervals between the up and down strokes of the float.

The piles B and the rack F F′ are of such length as to allow the racks to remain in contact with the cogs when the float is at its lowest and highest point in a calm at low tide or in a storm at high tide.

The float may be of any desirable form or shape—such as a buoy or boat—and may be moored on the seaward side, if desired.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The wave-motor set forth, comprising the combination of a float provided with anti-friction rollers and vertical fixed racks F F′, in combination with vertical guideways B, shaft H, journaled to revolve and provided with driving-wheel I fixed thereon, the two loose cog-wheels G G′, mounted upon said shaft, pawls J J′, pivoted to such cog-wheels, ratchet-wheels L L′, fixed upon such shaft, the crank S, a submerged pump having its cylinder anchored beneath, as shown, the piston of the pump, and the pitman V, connecting it with the crank S.

TRUMAN C. NARAMORE.

Witnesses:

JAMES R. TOWNSEND,

M. P. REYNOLDS.