No. 702,577. Patented June 17, 1902.

R. MILLAR.

WAVE MOTOR.

(Application filed Apr. 8, 1902.)

(No Model.)

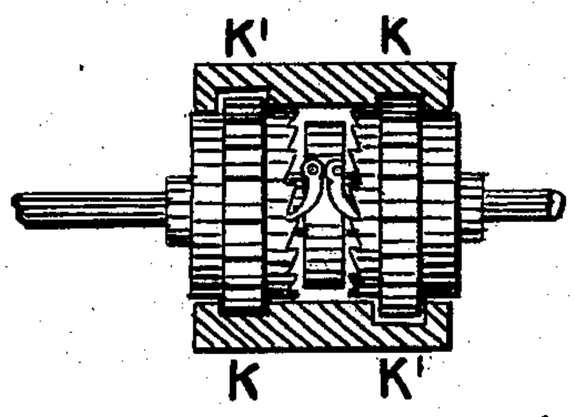

FIG 3

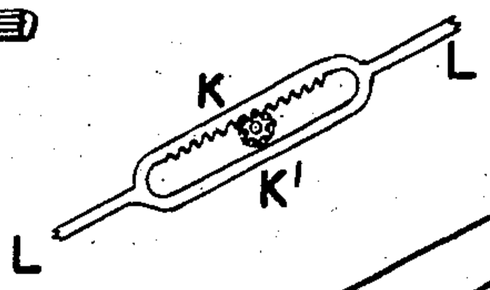

FIG 4

FIG 1

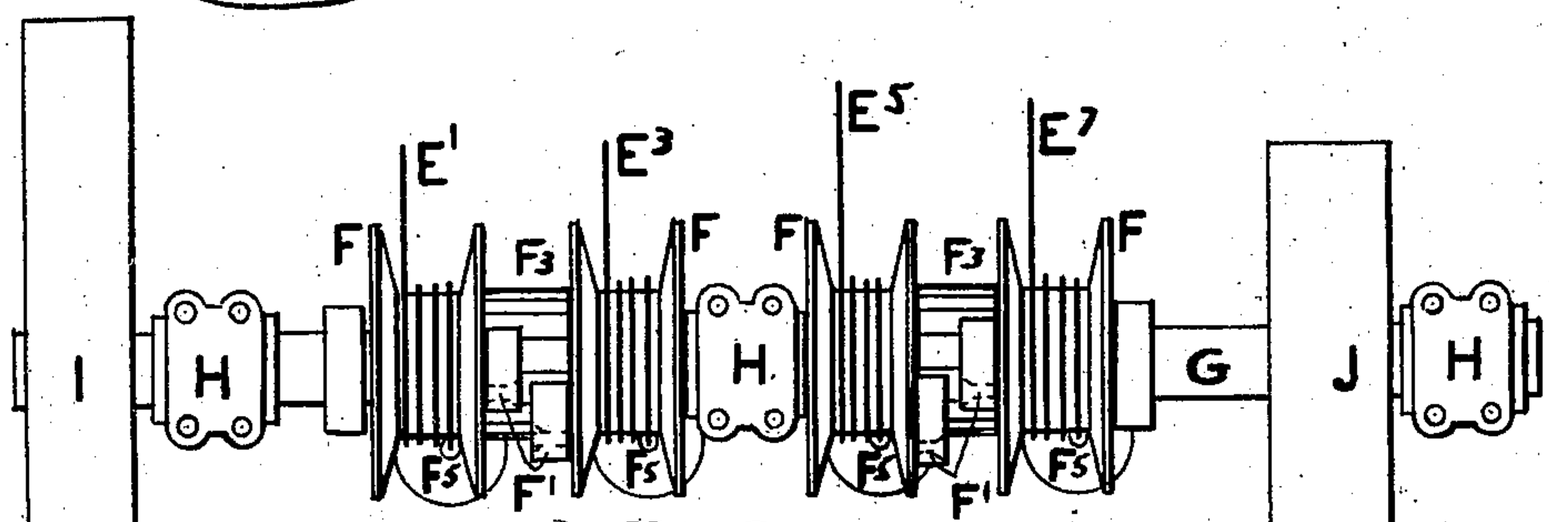

FIG 2

Witnesses:
C. D. Kesler

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UNITED STATES PATENT OFFICE.

ROBERT MILLAR, OF DUNEDIN, NEW ZEALAND.

WAVE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 702,577, dated June 17, 1902.

Application filed April 8, 1902. Serial No. 101,918. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MILLAR, a subject of the King of Great Britain, residing at 49 Moray Place, in the city of Dunedin, in the British Colony of New Zealand, have invented a certain new and useful Wave-Motor, of which the following is a specification.

The action of waves, especially of sea-waves, has not hitherto been successfully utilized in producing a continuous motive power; but in my invention means are set forth whereby the erratic motion as well as the rise and fall of the waves is converted into a rotary motion from which continuous power is obtained for any useful work. For this purpose I use a pontoon or floating body formed so as to move most when struck or lifted by waves in any direction. This pontoon is connected to a main shaft by rods or ropes and levers constructed to give motion to said shaft when moving in one direction and to slide past same when moving in a direction that cannot be so utilized. This is effected by rack, ratchet, or friction pulley movements, themselves well known, so that the main shaft is given a rotary motion in one direction, though obviously it will revolve at different speeds, according to the greater or less action of the waves. Continuous action is arrived at by making the main shaft drive a motor for storage, such as pumps for air or hydraulic power or dynamos for the storage of electricity, or any excess of power could be automatically shunted to other work by well-known mechanical governors, and any of these could be conveyed to a distance as needed in the usual manner. My invention, however, is confined to the utilization of the wave-power as applied to the driving of the main shaft aforesaid.

Referring to the accompanying drawings, Figure 1 is a general side view of the apparatus, showing the connections; and Fig. 2 is a plan of one method of converting the erratic wave movements into a rotary motion, showing ropes from the pontoons working their drums for this purpose. Fig. 3 is an alternative rack, pinion, and ratchet movement double-acting for use in convenient situations, especially where the distance from the shaft to the pontoons is not too great. Fig. 4 is a small side elevation of one of these racks and pinions.

A is any suitable pontoon or float, preferably angular, so as to have the greatest amount of motion in given waves. To this or to any structure on this, as A′, are attached rods or ropes, and it is also attached to a boom B (which would be nearly as broad as the pontoon or would carry outriggers for straighter leads to the ropes, as shown) by a gimbal-joint, allowing the pontoon any movement but that of twisting, as such would entangle the ropes C. The boom B is pivoted at D in any convenient place. To points in the pontoon or stand A A′ are attached a number of ropes, not less than three, as E′, E^3, E^5, and E^7, which are led past the boom B by sheaves to drums, each rope being balanced to keep it tight and bring back the drum and pawl for a fresh purchase. In practice any corner or the whole pontoon may move a rope or the whole, as the case may be, up or down, and one movement, preferably the downward movement, causes the shaft G to revolve.

F represents the drums, F′ the pawls, F^3 the ratchet-wheels, and F^5 the weights.

H represents suitable bearings.

I is a fly-wheel, and J is a pulley.

In Fig. 3, K is a rack, and K′ a plain slide working right and left handed ratchet-wheels by pawls. Fig. 4 shows one of these on a small scale, and the other rack is reversed, the teeth being on the under side and the slide being uppermost, so that a rotary movement is given to the shaft by either pulling or pushing the rods L L.

The boom B may be guyed to resist lateral motion, and it is obvious that the boom is not absolutely essential to this invention, as the ropes E′ E^3 E^5 E^7 could be connected to a bridge or such like where same was in a convenient position and be led from there to the shaft G; but it is believed that the apparatus as set forth is the most effective.

I am aware that pontoons or floats have been tried for this purpose before, but from their not being allowed full play they were not successful, whereas by my method every movement is taken advantage of.

In this invention any suitable materials or sizes may be adopted.

Having described my invention, what I claim is—

1. In a wave-motor, the combination of a suitable support, a power-shaft mounted on said support, a float, a connection between the float and support, such as to permit any movement of said float but that of twisting, and connections between three or more points on the outer edges of said float and said power-shaft.

2. In a wave-motor, the combination with a float and a power-shaft, of a boom, a connection between said boom and said float such as to permit any movement of said float but that of twisting, and connections between the outer edges of said float and said power-shaft.

3. In a wave-motor the combination of a suitable support, a power-shaft mounted on said support, clutch mechanism on said power-shaft for operating the same, a float, a jointed connection between the float and support such as to permit any movement of said float but that of twisting, flexible connections between the outer edges of said float and said clutch mechanism, and guides for said flexible connections located between said float and said clutch mechanism.

4. In a wave-motor, the combination with a float of a boom, a jointed connection between said boom and said float such as to permit any movement of said float but that of twisting, a power-shaft, clutch mechanism on said power-shaft for operating the same, flexible connections between the outer edges of said float and said clutch mechanism, and guides for said flexible connections, located between said float and said clutch mechanism.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT MILLAR.

Witnesses:

HENTON MACAULAY DAVEY,

ELIZABETH ANN DAVEY.