

993,835.

W. F. KELLEY.
WAVE MOTOR.
APPLICATION FILED FEB. 8, 1911.

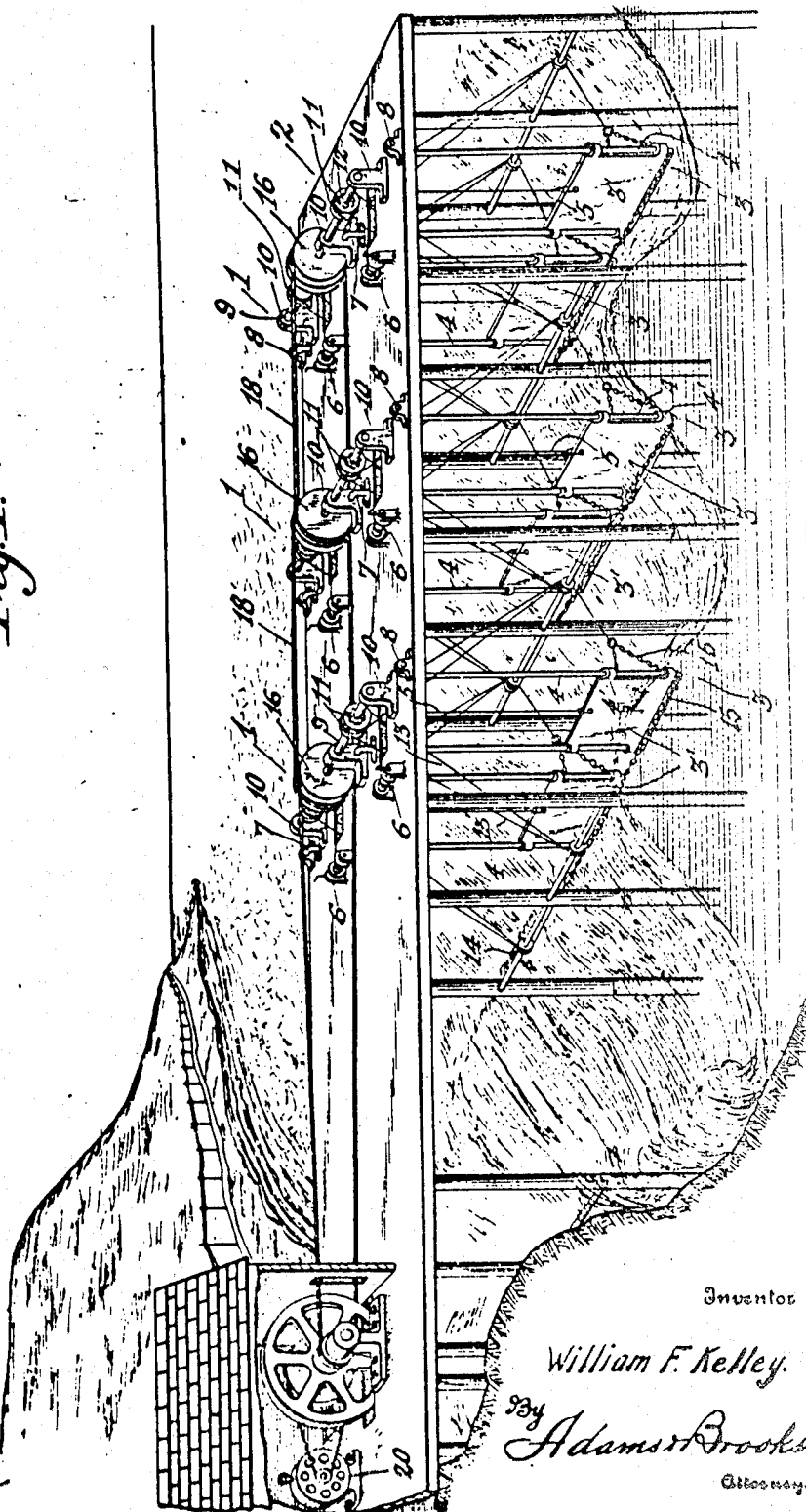
Patented May 30, 1911.
2 SHEETS—SHEET 1.

Fig. 1.

Witnesses

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 2 SHEETS—SHEET 2.

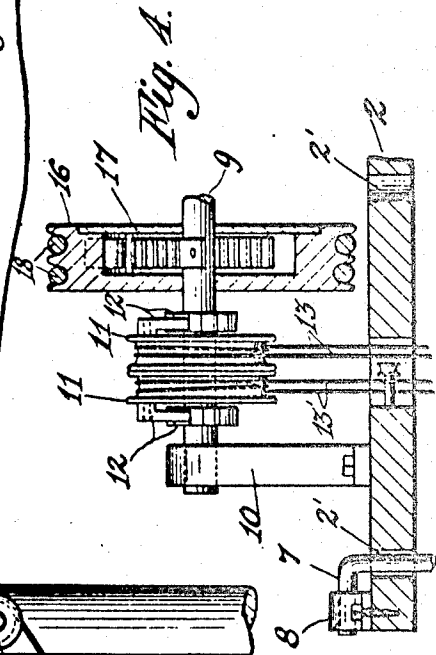
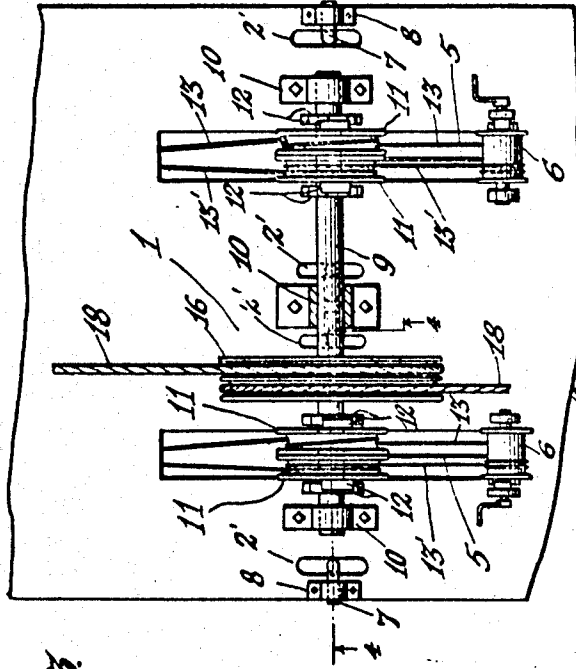
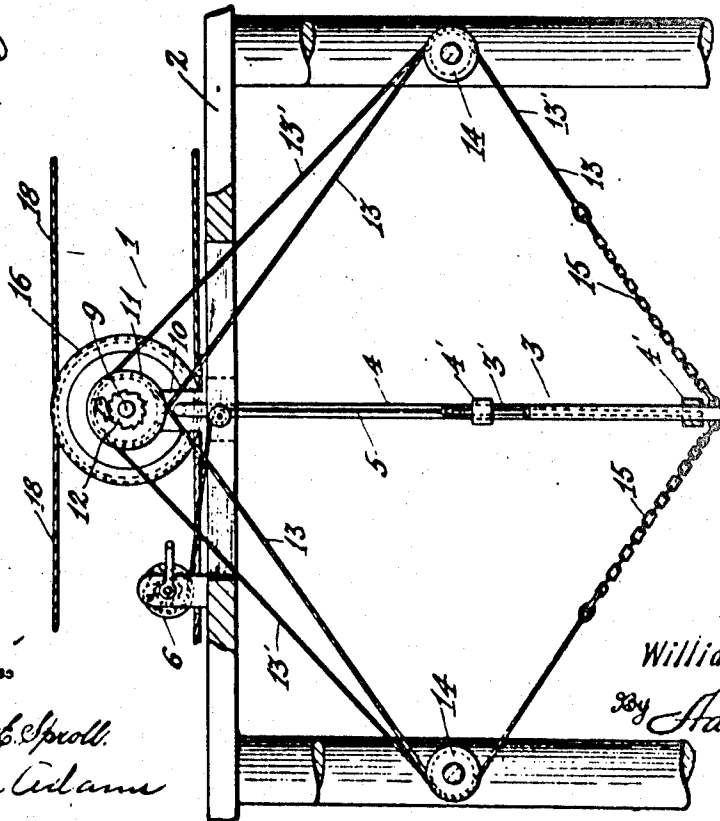


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM F. KELLEY, OF SEATTLE, WASHINGTON.

WAVE-MOTOR.

993,835.

Specification of Letters Patent. Patented May 30, 1911.

Application filed February 8, 1911. Serial No. 607,405.

To all whom it may concern:

Be it known that I, WILLIAM F. KELLEY, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Wave-Motors, of which the following is a specification.

My invention has for its primary object the provision of a novel construction wherein oscillatory motion of driving mechanism, driven through impact of the waves, is converted into a continuous rotary movement.

Further my invention resides in the provision of means affording a yielding connection between the driving mechanism and the mechanism or load driven thereby.

Another object is to provide a primary mover with a comparatively broad sectional impact receiving portion or face the component sections thereof being disposed abreast and being supported for independent movement.

Other objects will be set forth as my description progresses and those features of construction, arrangements and combinations of parts on which I desire protection succinctly defined in my annexed claims.

Referring to the accompanying drawings wherein like numerals of reference indicate like parts throughout the several views: Figure 1 is a perspective illustrating my invention in such form as now preferred by me. Fig. 2 is a fragmentary side elevation showing one unit of the system, parts being broken away. Fig. 3 is a fragmentary plan, and Fig. 4 is a transverse section of the upper portion of the pier and adjacent mechanism taken on line 4-4 of Fig. 3.

In carrying out my invention I prefer to employ a plurality of units 1, which are mounted on a suitable elevated support, as for example, a pier 2, and connected to cooperate in the development and transmission of power obtained from the force or impact of the water in motion. These units being identical in construction, a description of one will obviously suffice.

Reference numeral 3 indicates what I term the "primary mover or driver", or that part upon which the waves act directly for imparting motion thereto, the same consisting of a plurality of paddles 3' arranged abreast for independent movement, whereby I am enabled to provide a comparatively broad active or impact receiving face which will

in a great measure, obviate disastrous results due to torsional strain imposed by waves moving obliquely to the plane of the paddles.

The active faces of paddles 3' comprise panels which are mounted by guide eyes 4' for vertical adjustment in swing frames 4, and connected by cables 5, or the like, with respective drums 6, mounted on support 2, as shown, through which controlling mechanism the extent of projection of said panels into the water can be regulated, as will be readily understood. Swing frames 4 comprise side bars suitably connected to obtain rigidity, and having their upper end portions projecting through slots 2' of the deck of support 2 and provided with outwardly projecting stud shafts 7, journaled in bearings 8.

Reference numeral 9 indicates a shaft extending crosswise of support 2 over paddles 3' and journaled in stands 10. On shaft 9 I mount two pairs of loose wheels 11, conveniently in the form of grooved pulleys, each pair of which is associated with a respective paddle 3', for a purpose hereinafter made apparent. The pulleys 11 have releasable driving connection with shaft 9, to turn the latter continuously in one direction, through the medium of pawl and ratchet devices 12, the ratchet wheels of which are fixed to said shaft while the engaging pawls are carried by the pulleys, as shown.

Connected with each paddle 3', as by chain connections 15, are flexible connections 13, 13', as for example cables or the like, whose end portions lead from opposite sides of said paddle over guide sheaves 14 and thence up to pulleys 11 on which they are engaged, each being given one or more turns on a respective pulley with the winding of one extending relatively reversely to that of the other to thereby enable each flexible connection to rotate the pulley 11 engaged thereby, through an active step during movement of paddle 3' in a respective direction.

Reference numeral 16 indicates a pulley loosely mounted on shaft 9 and having a yielding connection therewith, as by a spiral spring 17, through the medium of which the "load" is picked up easily and abrupt shocks to the paddles and to the mechanism driven from shaft 9, obviated.

The pulleys 16 of the several units are connected by endless connections or belts 18

to operate as a single plant for supplying power for mechanical operations, as for example, the driving of a dynamo 20.

While I have herein shown and described a construction which will carry out the functions assigned to it, I wish it understood that I reserve the right to make various changes in the minor details of construction without departing from the spirit of my invention. For example, paddles 3' can be otherwise arranged than abreast, and wheels 11 can be employed singly instead of in pairs. The latter arrangement is, however, preferable inasmuch as it permits of a driving impulse being given to shaft 9 during each stroke of the related paddle 3'.

Having thus described my invention what I claim as new, and desire to secure by Letters Patent of the United States of America, is:

1. A wave motor comprising a support, a shaft journaled on said support, a pair of power transmission wheels loosely mounted on said shaft, releasable driving connections connecting each wheel for movement with said shaft in one direction, a paddle mounted on said support for movement in relatively opposite directions, guides on opposite sides of said paddle, and flexible connections each having their end portions secured to and leading from respective sides of said paddle and over said guides to said wheels, the intermediate portions of said flexible connections each engaged with a respective wheel for effecting an alternative operation of said wheels in one direction during movement of said paddle in reverse directions.

2. A wave motor comprising a support, a drive shaft journaled on said support, oscillatory means mounted on said support for movement by wave impact, said means comprising a plurality of independently movable paddles arranged abreast, loose wheels on said shaft arranged in pairs each of which pairs is associated with a respective paddle, releasable driving connections connecting said wheels with said shaft for movement therewith in one direction, and a pair of flexible connections between each pair of wheels and a paddle connecting the respective wheels of a pair for alternative movement in one direction during movement of the related paddle in reverse directions.

3. A wave motor comprising a support, a shaft journaled on said support, a pair of power transmission wheels loosely mounted on said shaft, releasable driving connection connecting each wheel for movement with said shaft in one direction, a paddle mounted on said support below said shaft for movement in relatively opposite direction, guides on opposite sides of said paddle, and flexible

connections each engaged with a respective wheel and with said guides and secured to said paddle for effecting an alternative operation of said wheels in one direction during movement of said paddle in reverse directions. 65

4. A wave motor comprising a support, a drive shaft mounted for rotation, oscillatory means mounted on said support for movement by wave impact, said means comprising a plurality of independently movable paddles arranged abreast, power transmission wheels having releasable driving connection with said shaft for movement therewith in one direction, said wheels being arranged in pairs each of which is associated with a respective paddle, and operative connections between each pair of wheels and a paddle connecting the respective wheels of a pair for alternative movement in one direction during movement of the related paddle in reverse directions. 70 75 80

5. A wave motor comprising a support, oscillatory means mounted on said support for movement by wave impact, said means comprising a plurality of independently movable paddles arranged abreast, a drive means mounted for rotation, loose wheels on said drive means arranged in pairs each of which pairs is associated with a respective paddle, releasable driving connections connecting said wheels with said drive means for movement therewith in one direction, and operative connections consisting of a pair of flexible members between each pair of wheels and a paddle connecting the respective wheels of a pair for alternative movement in one direction during movement of the related paddle in reverse directions. 85 90 95 100

6. A wave motor comprising a support, oscillatory means mounted on said support for movement by wave impact, said means comprising a plurality of independently movable paddles, a drive means mounted for rotation, loose wheels on said drive means arranged in pairs each of which pairs is associated with a respective paddle, releasable means connecting said wheels with said drive means for movement therewith in one direction, and a pair of flexible connections between each pair of wheels and a paddle connecting the respective wheels of a pair for alternative movement in one direction during movement of the related paddle in reverse directions. 105 110 115

Signed at Seattle, Washington this 1st day of February 1911.

WILLIAM F. KELLEY.

Witnesses:

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A. A. BOOTH.