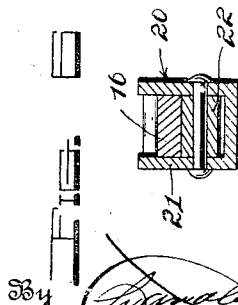


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Patented May 6, 1913.

2 SHEETS—SHEET 1.



Inventor:

J. Frame.

Witnesses

Frank S. Ratchiff
George F. Talbot

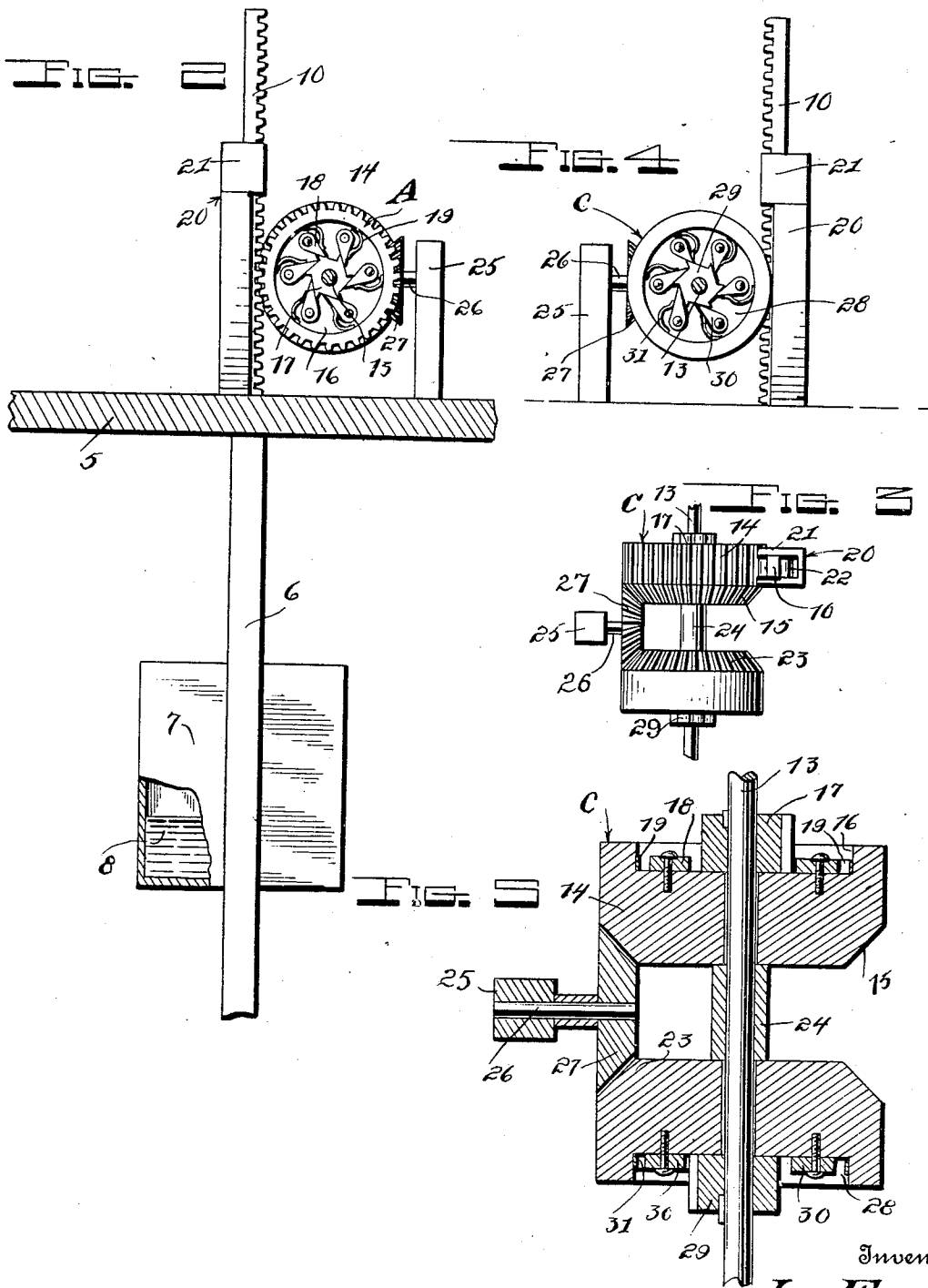
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WAVE MOTOR.
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2 SHEETS—SHEET 2.



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WAVE-MOTOR.

1,061,061.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN FRAME, a citizen of the United States, residing at Searsport, in the county of Waldo, State of Maine, have invented certain new and useful Improvements in Wave-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in wave motors.

The principal object of the invention is to provide a wave motor in which a continuous movement is imparted to a shaft by the rise and fall of one or more floats.

Another object of the invention is to provide a reciprocatory rack bar, a driven shaft and a novel driving means between the bar and the shaft for imparting a continuous rotary movement to the latter upon movement of the former.

A further object of the invention is to provide a wave motor of the character described, which is composed of a relatively few number of parts, is therefore simple in construction, and is cheap to manufacture.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claim hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claim may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings: Figure 1 is a side elevation showing a train of wave motors constructed in accordance with my invention, Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 1, Fig. 3 is a detail top plan view showing the driving connection of one of the motors, Fig. 4 is a detail sectional view taken on the line 4—4 of Fig. 1, Fig. 5 is an enlarged longitudinal sectional view through the driving connection, and Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 1.

Like reference numerals designate corresponding parts in all the figures of the drawings.

Referring to the drawings, 5 designates a

wharf of any suitable construction, and supported by said wharf is a train of motors designated by the reference letters A, B and C, it being understood that any number of these motors may be employed. Each motor includes a spaced pair of guide bars 6—6 which depend from the wharf 5 and are suitably braced to said wharf. Slidably mounted for reciprocatory movements between said guide bars is a float 7 which is preferably balanced with water or other suitable weight 8. Centrally connected to the float by means of a ball and socket joint 9 is the lower end of a rack bar 10, the upper end of said bar projecting through the wharf 5 and operating in a suitable guide. The rack bars 10 of the various motors are arranged in alinement, and suitably supported upon the wharf 5 by means of brackets 12, is a driven shaft 13, said shaft being disposed in parallel relation to the rack bars 10.

In order to impart a continuous rotary movement to the driven shaft 13 from the reciprocating bars 10 of each motor, each motor is provided with a novel driving connection between the rack bar 10 and the shaft 13, and loose on this shaft 13 is a toothed gear 14 having a beveled gear 15 formed on its inner face. The outer face of the gear 14 is formed with a counterbore 16 for receiving a ratchet wheel 17 which is fixed to the shaft 13. Disposed within the counterbore 16 and secured to the outer face of the gear 14 is a plurality of pawls 18 adapted for engagement with the ratchet wheel 17. These pawls are yieldably urged into engagement with said wheel by means of springs 19. It will of course be understood that the gear wheel 14 is in mesh at all times with the rack bar 10, and therefore, it will be observed that upon upward movement of said rack bar, the gear 14 will be rotated, and through the medium of the pawls 18 and ratchet wheel 17, the shaft 13 will be rotated.

In order to retain the rack bar 10 in engagement with the gear wheel 14, there is provided a bracket 20, the upper end thereof being formed with a guide 21 for receiving the upper end of the rack bar, said guide being disposed on the side opposite the gear wheel 14 and carrying an anti-friction roller 22, for engagement with said rack bar.

In order to transmit a continuous rotary movement in the same direction to the shaft 13 when the rack bar 10 reciprocates, there

is loosely mounted upon the shaft 13 in spaced relation to the bevel gear 15, a beveled gear 23, said gear being held in its spaced relation by means of a spacing sleeve 24. A standard 25 is supported on the wharf 5, and this standard carries a stub axle 26, and on this shaft is loosely mounted a beveled pinion 27 which meshes with the bevel gears 15 and 23. The outer face of the beveled gear 23 is counterbored, as at 28, and fixed to the shaft 13 and projecting into said counterbore is a ratchet 29 having its teeth disposed opposite the teeth of the ratchet wheel 17. Carried by the outer face of the beveled gear 23 is a plurality of pawls 30 which engage the ratchet wheel 29, and these pawls are yieldably held into engagement with said wheel by means of springs 31. It will thus be observed that when the rack bar 10 is lowered, the gear 14 will rotate in a direction to cause the pawls 18 to ride over the ratchet wheel 17, and as a result, no motion will be transmitted to the shaft 13. As the gear 14 thus rotates, the pinion 27 is rotated and this pinion rotates the bevel gear 23. The bevel gear 23, through the medium of the pawls 30 and ratchet wheel 29, cause the shaft 13 to be further rotated continuously in the same direction as when the rack bar 10 was being elevated.

From the foregoing, it will be observed that as the waves consecutively elevate the

floats 7 of the respective motors A, B and C, the racks 10 will be elevated as above described, and as a result, transmit motion to the shaft 13. As the waves pass the floats will be lowered and thereby impart further continuous rotary movement to the shaft, as above described. It will also be observed that this motor will be operated by the rise and fall of the tides.

What is claimed is:

In a wave motor, the combination with a reciprocatory rack bar, of a shaft, a gear wheel loose on the shaft and continuously engaged with said rack bar, said gear wheel being formed on its inner face with a bevel gear, means connecting the gear wheel and shaft for rotating the latter in one direction upon the up stroke of said bar and for releasing the gear wheel from the shaft upon the down stroke of said bar, a bevel gear loose on the shaft and disposed in spaced relation to the first mentioned bevel gear, a bevel pinion connecting said bevel gears, the means connecting the last mentioned bevel gear and the shaft for continuously rotating the latter in the same direction upon the down stroke of said bar.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHN FRAME.

Witnesses:

A. H. NICHOLS,
H. E. BANGS.