E. E. SHINN.

WAVE MOTOR.

APPLICATION FILED MAY 23, 1910.

969,665. Patented Sept. 6, 1910.

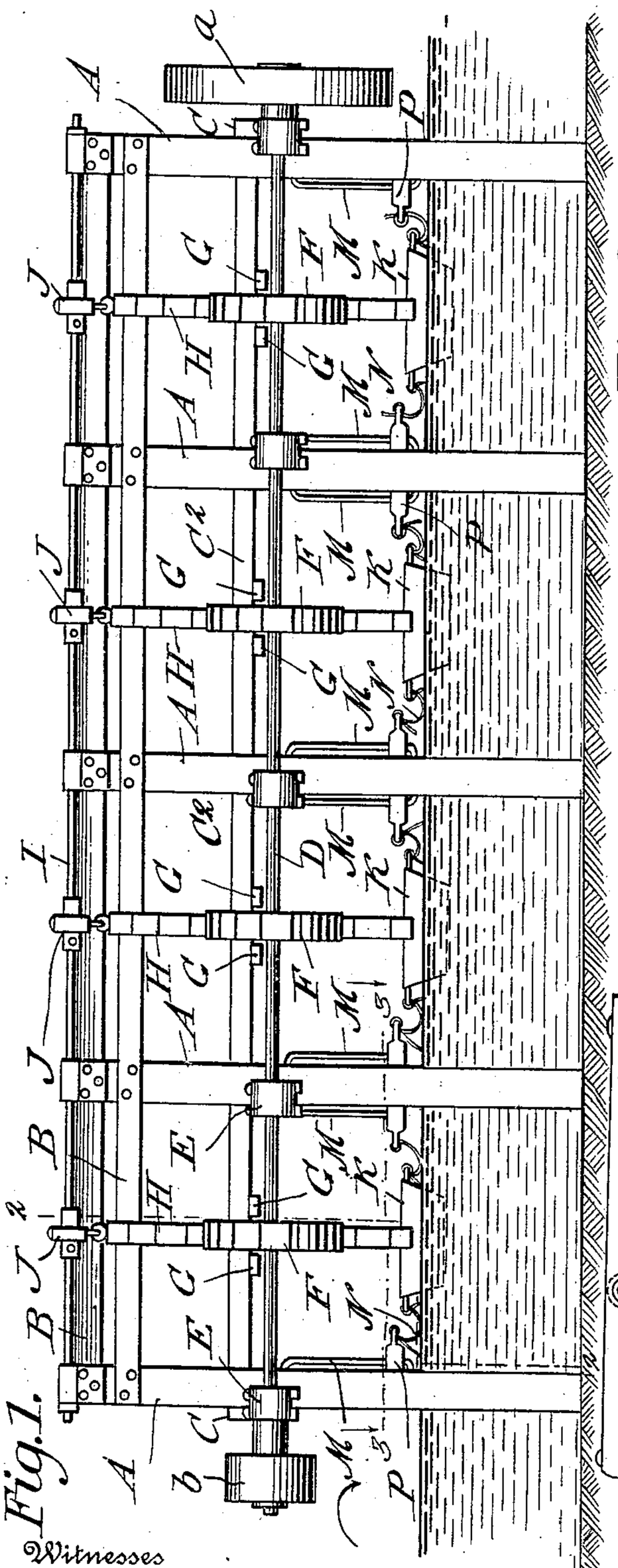

Fig. 1.

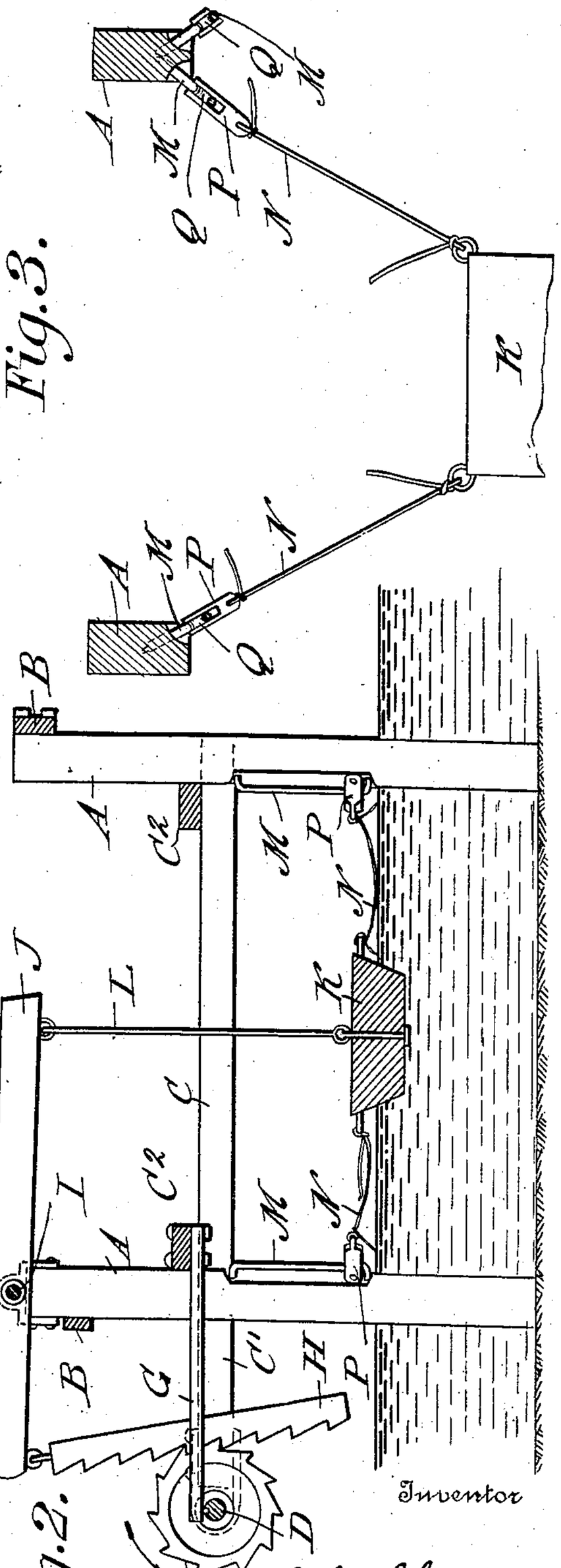

Fig. 3.

Fig. 2.

Witnesses

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WAVE-MOTOR.

969,665. Specification of Letters Patent. Patented Sept. 6, 1910.

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To all whom it may concern:

Be it known that I, EDWARD E. SHINN, citizen of the United States, residing at Montrose, in the county of Montrose and State of Colorado, have invented new and useful Improvements in Wave-Motors, of which the following is a specification.

My present invention pertains to wave motors of the type in which floats are raised by waves and the gravitation of the floats is utilized to rotate a shaft from which power may be taken for various purposes.

The object of the invention is to provide a wave motor, of the class described, which is simple, inexpensive and easily installed, and which embodies means whereby the floats are held against undue sidewise movement without interfering with the free up and down movements of the floats necessary to the utilization of the power of the waves.

With the foregoing in mind the invention will be fully understood from the following description and claim when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a side elevation of a wave motor constructed in accordance with my invention. Fig. 2 is a cross-section taken in the plane indicated by the line 2—2 of Fig. 1. Fig. 3 is an enlarged, detail horizontal section taken in the plane indicated by the line 3—3 of Fig. 1, and illustrating the manner in which each float is connected with the four frame uprights grouped about the same.

Similar letters designate corresponding parts in all of the views of the drawings.

The main frame of my novel motor may be of any construction consonant with the purpose of my invention. I prefer, however, to have it comprise a plurality of piles A, longitudinal bars B fixed to and connecting the piles of the two longitudinal series shown, cross-bars C fixed to the piles and extending between the two longitudinal series and also extending outward beyond one longitudinal series of piles, as indicated by C′, and longitudinal horizontal bars C^2 fixed in position on the cross-bars C and arranged against the inner sides of the piles in the two longitudinal series.

D is a longitudinal shaft journaled in suitable bearings E carried by the extended portions C′ of the frame bars C, and having a balance wheel *a* at one end and a band pulley *b* or other suitable motion-transmitting device at its opposite end.

F F are ratchet wheels fixed on the shaft D at intervals in the length thereof.

G G are arms, preferably of metal, fixed to one of the frame bars C^2 and arranged in pairs and at opposite sides of the ratchet wheels F in order to guide and prevent lateral deflection of the vertically movable toothed bars H.

I is a longitudinal shaft suitably mounted on the frame.

J J are independently movable levers fulcrumed in a loose manner on the shaft I and having outer arms loosely connected with the upper ends of the toothed bars H.

K K are vertically movable floats each of which is connected through a rod L with the inner arm of the lever J above it, and M M are vertical guide-rods connected with the piles A of the frame. By comparison of Figs. 2 and 3 it will be observed that four piles A are grouped about each of the floats K, and that each float K is connected with the four guide-rods M grouped about the same through the medium of cables N connected at their inner ends to the four corners of the float, and at their outer ends to blocks P, which latter straddle the guide-rods M and are provided with anti-friction wheels Q, which bear against the guide-rods M at the opposite sides of said rods, with reference to the float. By virtue of this construction it will be manifest that each float K is held against material lateral movement by the flexible cables N, and it will also be manifest that each float K is free to be raised by waves and is equally free to subsequently gravitate and pull downward on the inner arm of its respective lever J. It will further be manifest that the blocks P are free to move up and down with the floats K, and that in consequence the floats will be held against material lateral movement irrespective of the height of the floats.

In the practical operation of my novel motor, the waves operate to lift the floats K, whereupon the coöperating levers J and toothed bars H are properly positioned relative to the ratchet wheels F, and then when the floats gravitate the downward pull exerted by the floats is utilized, practically without lost motion, to rotate the shaft D in the direction indicated by arrow, through the medium of the toothed bars H and the ratchet wheels F. In this connection it will

be observed that the toothed bars H tend to swing toward the center of the ratchet wheels F, and that therefore the said toothed bars are always in readiness to immediately turn the ratchet wheels when the said bars are drawn upward.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

A wave motor comprising vertically movable floats, a fixed main frame having a plurality of uprights grouped about each float, guide-rods extending vertically and carried by said uprights, blocks movable vertically on said guide-rods, cables connecting the floats with the said blocks, vertically swinging levers fulcrumed at intermediate points of their length on the main frame, rods connecting the floats with the inner arms of said levers, toothed bars loosely connected with and depending from the outer arms of said levers and free to swing toward and from the floats, a longitudinal shaft journaled in bearings carried by the main frame, ratchet wheels fixed on said shaft and each arranged opposite one of the said toothed bars, and arms fixed with respect to the main frame and arranged at opposite sides of and adjacent the toothed bars and the ratchet wheels to prevent undue sidewise movement of said bars.

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

EDWARD E. SHINN.

Witnesses:

HUGO SELIG,

ROBERT M. WRIGHT.