

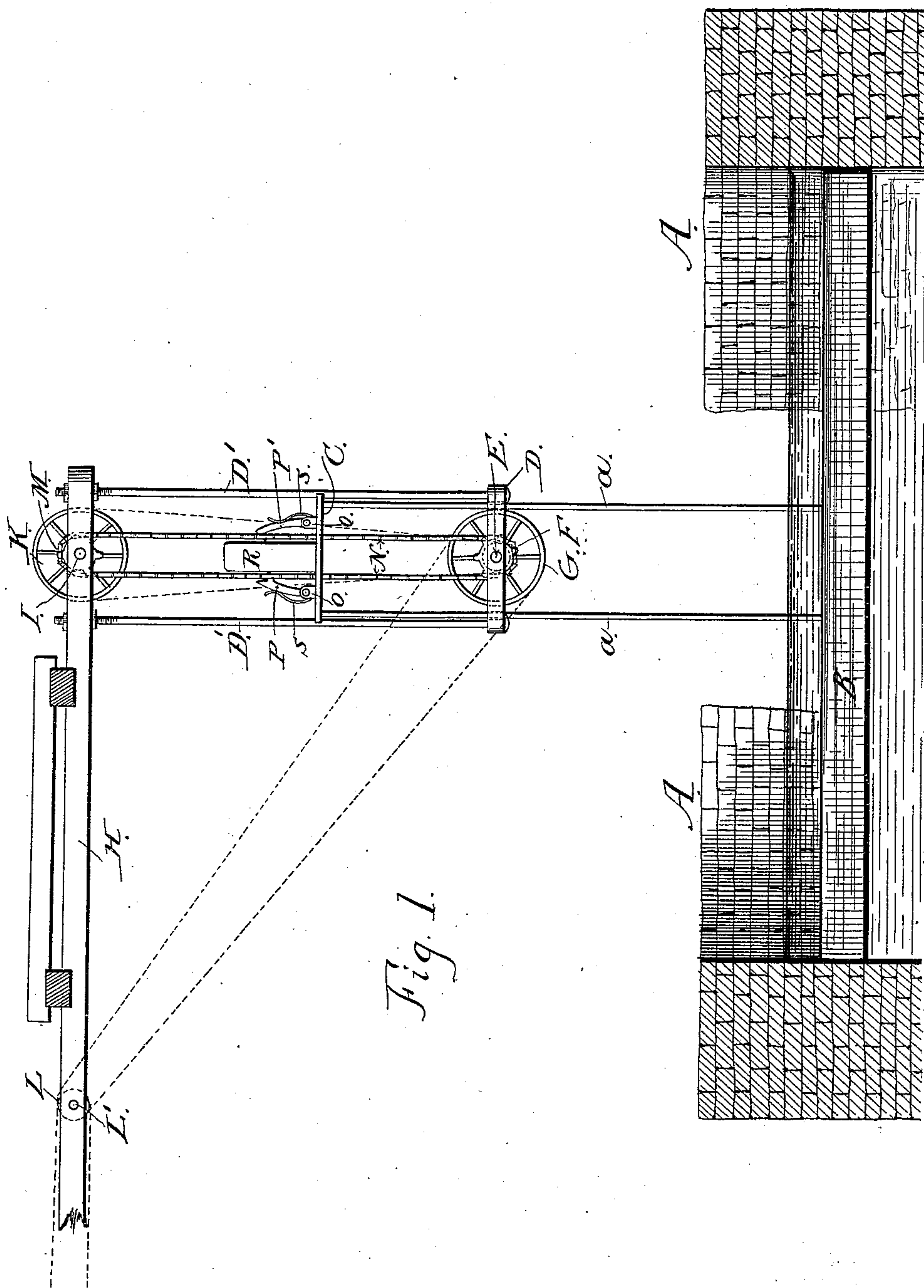
(No Model.)

2 Sheets—Sheet 1.

G. M. COPELAND.
TIDE MOTOR.

No. 446,057.

Patented Feb. 10, 1891.



Witnesses
Chapman Fowler
Jew. Fowler

Inventor
George M. Copeland
by A. H. Evans & Co
Attorneys

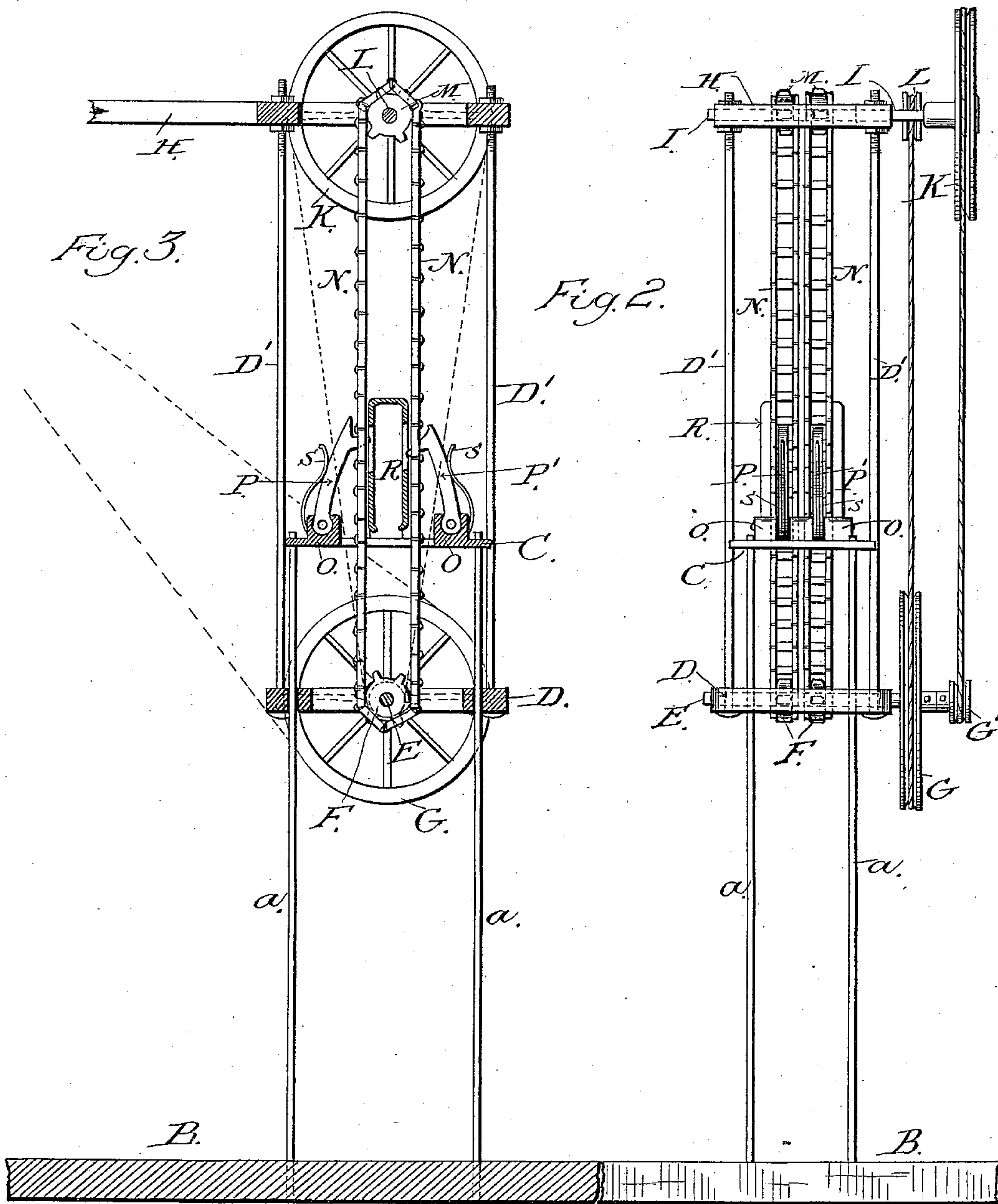
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UNITED STATES PATENT OFFICE.

GEORGE M. COPELAND, OF BROCKTON, MASSACHUSETTS.

TIDE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 446,057, dated February 10, 1891.

Application filed July 15, 1890. Serial No. 358,820. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. COPELAND, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Tide-Motors, of which the following is a full and clear description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a tide-motor embodying my invention. Fig. 2 is an end view. Fig. 3 is a vertical sectional view.

My invention relates to certain new and useful improvements in that class of motors which are operated by the rise and fall, or ebb and flow, of the tide; and my invention consists in the constructions and combinations and devices which I shall hereinafter fully describe and claim.

To enable others skilled in the art to which my invention appertains to make and use the same, I will now describe its construction and indicate the manner in which the same is carried out.

In the accompanying drawings, A represents a suitable guide, such as a sea-wall, pier, or like structure. A float B is suitably mounted within this structure, and is connected with a platform C by means of connecting-rods *a*, whereby the platform and float proper are secured together and move in unison as the tide rises and falls. A frame D, suspended by rod-hangers or rods D' from a frame-work H above, has mounted within it a counter-shaft E, on which, between the inner sides of the frame D, are mounted sprocket-wheels F, while on the outer end of said shaft, or at some other point, if desired, is a large band-pulley G, to which is keyed or otherwise secured a small band-pulley G'. The upper ends of the rods or hangers D' are secured in a frame H, which has journaled within it a shaft I, that has keyed or otherwise secured to it a large band-pulley K, from which a band runs to the small pulley G', while a second band extends from the large pulley-wheel G to a small pulley L on a shaft L', located at some point where it will be convenient to transmit the power communicated to the small pulley L to a dynamo or other machine or apparatus to be driven.

The shaft I carries sprocket-wheels M, from which chains N extend to the sprocket-wheels F on the shaft E.

Within or between suitable standards O on the upper platform C of the float are pivotally secured pawls P P', which engage the chains and communicate motion thereto. These pawls are arranged on opposite sides of a guide or post R, rising from the platform C and serving as a guide for the chains, and its sides may be slotted to receive the hook-shaped ends of the pawls, which latter are held inward against the chain, so that their ends may engage the links of the chain by means of springs S, which bear against them.

From this description it will be seen that when the motor is in position its float is caused to ascend by the rising tide, and as the platform C of said float carries the pawls it is manifest that as said float rises the pawls P on one side of the post or guide R engage the chains on that side and exert a lifting power thereto, thereby causing these endless chains to start in motion and communicate power to the shaft I and its band-pulley, and from this pulley the power is transmitted to the small pulley G' on the shaft E, and thence from the large pulley G to the pulley L, and finally to the machine to be driven. As the tide falls the float is allowed to descend of its own gravity, the opposite pawls P' in this instance serving to pull upon the chains and by this means continue the motion of the chains, and thereby furnish a continuous motion in one direction to the machine or device to be driven. The motion is therefore a continuous uninterrupted one, the pawls on one side operating, while those on the other side remain idle and serve as safety or holding pawls.

I do not limit myself to any particular number of chains and pawls or to any specified number and size of band-wheels, for the same may be varied at pleasure to meet existing circumstances and to obtain the requisite amount of speed and power.

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

1. A tide-motor comprising a vertically-moving float, a guide therefor, the endless chains, a double series of pawls carried by

the float and engaging the chains for imparting a continuous movement thereto in one direction during both movements of the tide, and power-transmitting connections from said chains, substantially as herein described.

2. In a tide-motor, the combination of the rising-and-falling float provided with a double series of alternately-acting pawls, shafts having sprocket-wheels, endless chains passing around said wheels and having their links engaged by said pawls to start the chains in motion as the float rises and falls, and power-transmitting devices comprising pulleys of varying sizes for communicating power to the machine or device to be driven, substantially as herein described.

3. A tide-motor comprising a rising-and-falling float, a plurality of double-acting spring-actuated pawls carried thereby, endless chains adjacent to said pawls, whereby the latter may engage said chains to start them in motion as the float moves in one direction and to continue the motion in the same direction when the float moves in a reverse direction, and power-transmitting devices from said chains to the machine to be driven, substantially as herein described.

4. In a tide-motor, the combination of a rising-and-falling float provided with a plat-

form C, the double series of pivotally-secured double-acting pawls carried by the platform and having springs bearing against them, shafts mounted in fixed supports, a plurality of chains engaged by the pawls on opposite sides, whereby a continuous movement is given the chains during both the rise and fall of the float, and pulleys of varying sizes for transmitting power from the motor to the machine to be driven, substantially as herein described.

5. A tide-motor consisting of a float, a platform above the float and connected to it by means of rods, whereby the float and platform move together, a plural series of pawls pivotally secured to said platform, a guide-post rising from said platform, shafts above and below the platform, endless chains passing around sprocket-wheels on said shaft and having their links engaged by said pawls, springs for holding the pawls against said chains, and power-transmitting pulleys from said chains to the machine to be driven, substantially as herein described.

GEORGE M. COPELAND.

Witnesses:

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CHAPMAN FOWLER.