

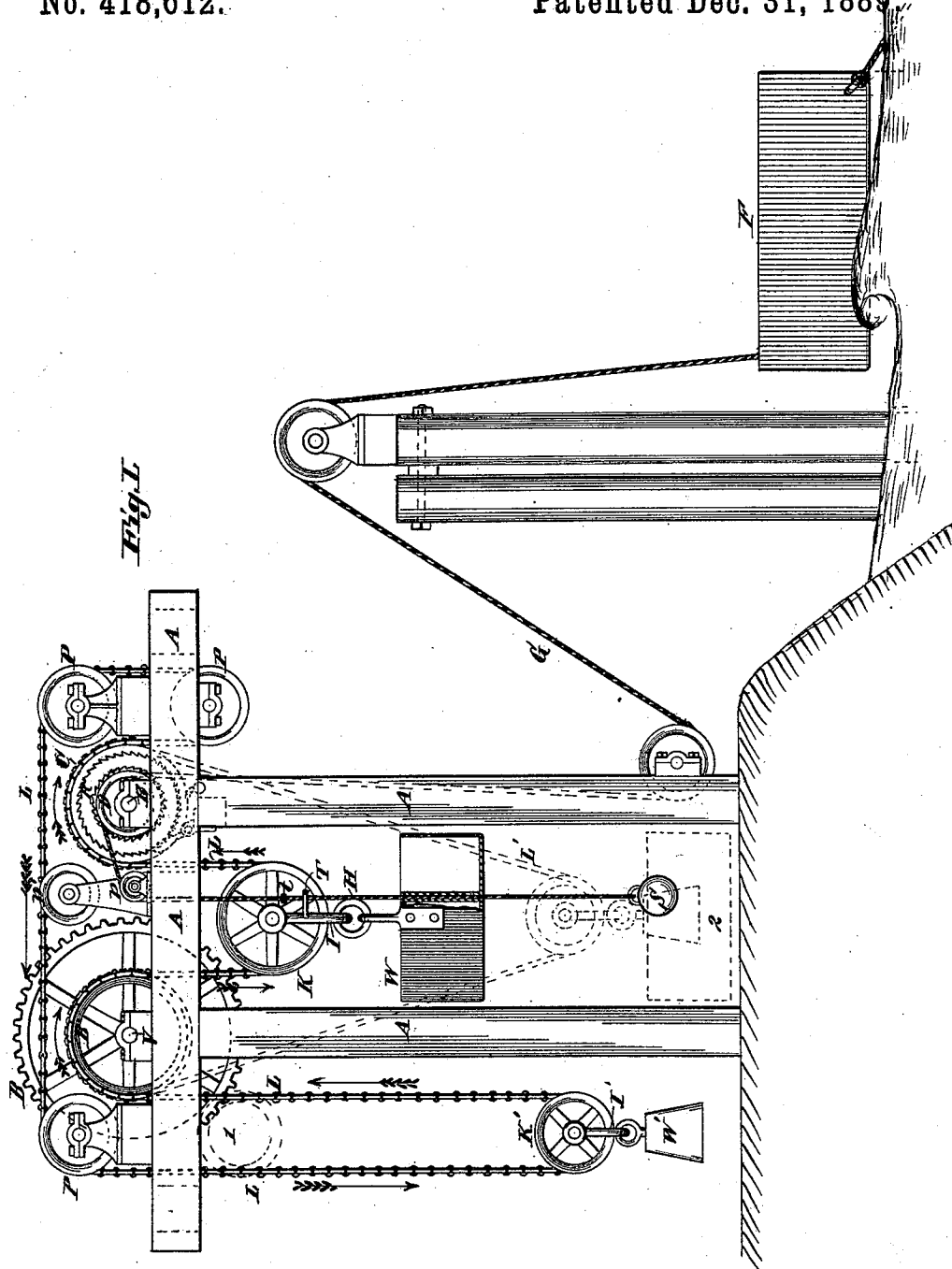
(No. Model.)

2 Sheets—Sheet 1.

I. ST. C. GOLDMAN.  
OCEAN MOTOR.

No. 418,612.

Patented Dec. 31, 1889.



Attest:  
Charles Pickles,  
J. M. Wallace

Inventor:  
Isaac St. Clair Goldman  
By Wm. M. Eccles.

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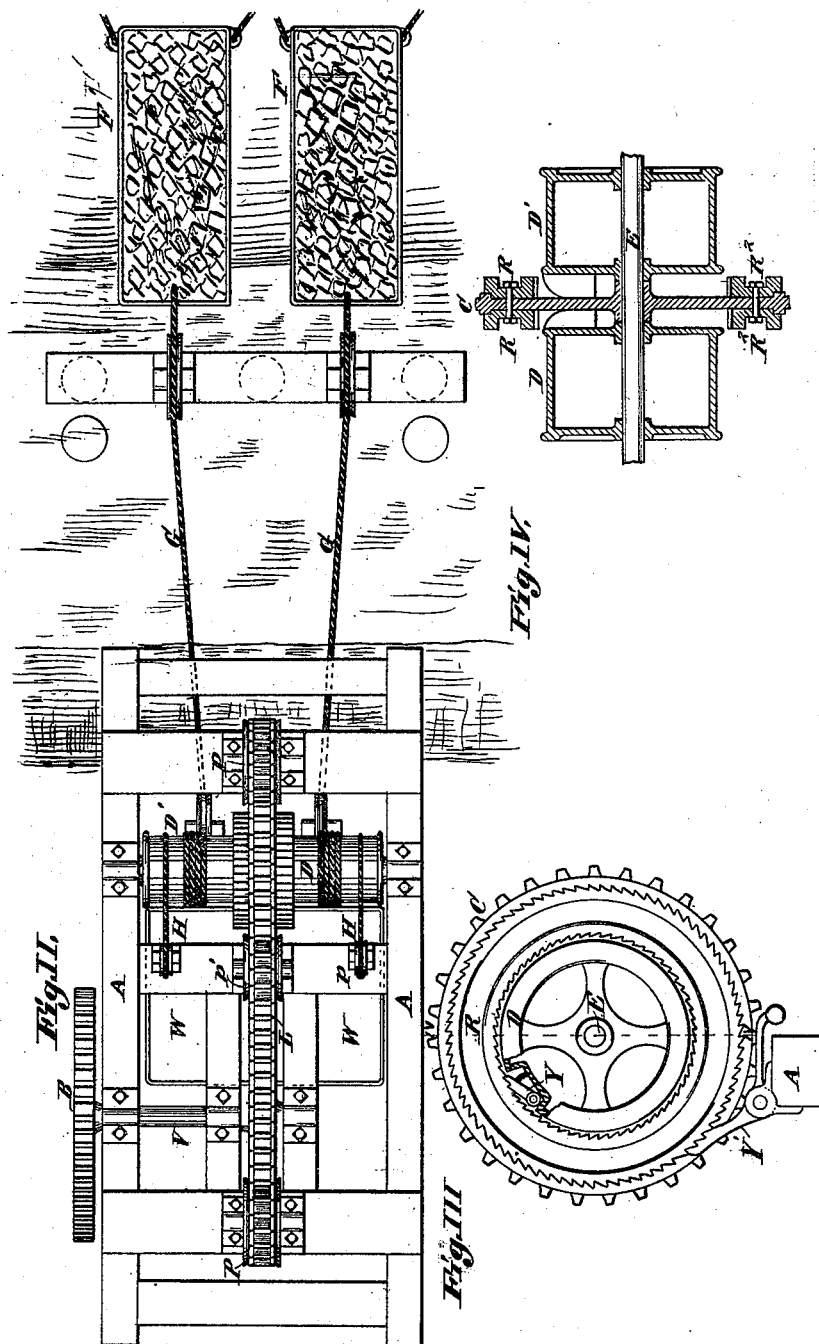
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*Atty*

# UNITED STATES PATENT OFFICE.

ISAAC ST. CLAIR GOLDMAN, OF LOS ANGELES, ASSIGNOR OF PART TO HENRY TIMKEN AND R. B. DAVY, OF SAN DIEGO, CALIFORNIA.

## OCEAN-MOTOR.

SPECIFICATION forming part of Letters Patent No. 418,612, dated December 31, 1889.

Application filed October 5, 1889. Serial No. 326,101. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC ST. CLAIR GOLDMAN, a citizen of the United States, residing in the city of Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Ocean-Motors, of which the following is a specification.

My invention relates to improvements in ocean-motors which are driven by irregular power, such as waves or currents of the sea; and the objects of my invention are to store up this irregular power and transmit it regularly to machinery driven by said power.

The invention consists in a motor comprising one endless traveling chain or belt and a power-wheel held loosely in and engaging the chain or belt and a regulating-wheel resting in said chain or belt and adapted to move up and down and carry a weight, whereby the power which is transmitted to the working machinery is regulated.

My invention consists, also, in the construction and modification of parts, as herein fully set forth and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure I is a side elevation of my invention. Fig. II is a plan view of my invention. Fig. III is a detached elevation showing the ratchet-wheel R, sprocket-wheel C, pawls Y Y', drum D, and shaft E, and part of frame A. Fig. IV is a vertical section drawn on line IV IV, Fig. III.

The letter A is the frame-work of my machine. This frame-work is adapted to carry the driving-wheel B, the motor-wheel C, the sprocket-wheel B', and such other additional wheels as are necessary to carry the endless chain and to keep it in position, as hereinafter explained.

F is a float placed in the ocean so as to receive the action of the waves and so anchored as to allow it to move up and down with the wave or movement of the ocean. This float, which is weighted with heavy weights, is connected with the drum D by means of a strong cable G. This cable is wound around the drum at the upper end, and is connected with

the float at its lower end. To this drum D is also connected a rope H, which rope passes over a pulley *p* on the top of the frame-work, and is connected with the weight S at the lower end sufficiently heavy to turn the drum D back and wind up the slack of the cable G as the float F rises. This rope H is supplied with a knot or suitable stop *t*, and passes through the eye of an arm T, which is fixed to the stirrup I. This knot or stop operates to allow the rope to pass downward only to the knot or stop *t*, and will only permit that portion of the slack of the cable to be taken up which would amount in length to the distance between the arm T and the stop *t*.

The drums and floats may be multiplied, as seen in Fig. II designated by D and D' and the multiple floats by F and F'.

K is a large pulley adapted to travel in the chain L, and is supplied with a stirrup I, to which is attached a heavy weight W, and is adapted to move up and down with the chain L. The purpose of this pulley and weight is to continue the motion of the machine while the float F is rising, and also to regulate the transmission of power from the float F to the wheel B, and thence to the machinery to be operated.

L is a sprocket-chain or heavy belt or cable which is endless, and passes under the pulley K and over a sprocket-wheel B', under a pulley K' and over guide-pulleys P P P, and on and over a sprocket-wheel or power-wheel C, and then downward to the pulley K again. The sprocket-wheel B' is made fast to the shaft V, which shaft is journaled in the frame-work A and carries the wheel B. To the pulley K' is attached a small weight W' by means of a small stirrup I'. The object and purpose of this weight and pulley are to simply take up the slack of the chain L and make it mesh in the sprocket-wheels B' and C. It will move up and down as the weight W moves up and down—that is, as the weight W descends to the position of the dotted line, digit 2, the weight W' will be in the position of the dotted lines, digit 1.

The object of passing the endless chain around the pulleys P P P and down the side of the frame-work is to economize space and to put the weight W' out of the way of the

weight W. It could, however, be placed in position of the dotted lines L and the pulleys P P P dispensed with.

5 *p'* is a small carrying-pulley situated on top of the frame-work and adapted to carry the chain L and support it between the two pulleys P P.

R is a double ratchet-wheel, one ratchet reversed to the other and fixed to the sprocket-wheel C.

Y is a pawl engaging the inner ratchet of the ratchet-wheel R, and is situated in the drum D.

Y' is a pawl adapted to engage the outer ratchet of the ratchet-wheel R, and is connected to the frame-work A. This ratchet-wheel R is so arranged as to transmit motion from left to right to the wheel C as the float F descends, and also to allow the drum to revolve from right to left as the float F rises, and not move the wheel C as the float F rises. This ratchet-wheel R and pawl Y' operate so as to allow the ratchet-wheel to turn from left to right, but prohibit from turning the other way, thus turning the sprocket-wheel C from left to right in the direction of the arrow, by means of the inner ratchet engaging the pawl Y on the drum D, and prevents it from turning from right to left when the pressure of the float is removed from the drum D, thus operating the movement of the chain L in its general course over the wheel C from left to right.

The wheel B is connected to any machinery which it is desirable to operate by sprocket-chains, spur-wheels, or belts.

Now, when the float F is caused to rise by the action of the water, the weight S will wind the drum D up and take up the slack of the cable G until the knot *t* reaches the arm T, when it will stop winding the cable G, and if the float F rises any higher the excess of cable will not be wound onto the drum. When the float begins to descend, however, the ratchet-wheel R<sup>2</sup> will engage the pawl Y and move the wheel C from left to right, which will move the chain L in the same direction and lift the weight W toward the top, when the pressure of the float F is sufficiently taken off the drum so as to leave only enough pressure to balance the downward pressure of the weight W on the wheel C. Then the ratchet-wheel R will engage its pawl Y' and prevent the wheel C from taking a backward course, and the weight W will begin to descend. This operation will always keep up a continuous motion of the wheel B from left to right in the direction of the arrow; and the machinery connected with this wheel will be kept constantly running

while the float F is rising as well as while it is falling. The wheel C is mounted on its shaft E, so that it always moves with the ratchet-wheel R. This endless chain, always running in the same direction, is much cheaper and stronger and much more durable than if two chains were used, as shown in my former patent, No. 347,705, dated August 17, 1886. The chain, being made in one piece instead of being two chains, is made to run always in the same direction, and the pulley K need not be made with sprocket-teeth, but is made a plain-faced pulley, thus obviating the wear of sprocket-teeth on the sprocket-chain at the pulley K, and also obviating the necessity of sprocket-teeth, which are a matter of necessity in the old motor patented by me.

Now what I claim as new, and for which I ask Letters Patent of the United States to be granted to me and my assigns, is—

1. A motor having a float actuated by water, a drum connected to said float by means of a cable, a double reversed ratchet-wheel connected to a sprocket-wheel and adapted to engage a pawl in the drum, and on the frame-work a second sprocket-wheel, said sprocket-wheels journaled on the frame-work, an endless sprocket-chain passing over said two sprocket-wheels, and a pulley supplied with a weight swinging in said sprocket-chain between said sprocket-wheels, substantially as described, and for the purposes set forth.

2. In a motor, an endless chain or belt passing over two wheels, one of which is actuated by a float moved by the waves or tide of the sea, and passing under a pulley supplied with a weight, as above described, and for the purposes set forth.

3. In a motor, the combination of a float F, a cable G, a drum D, double reverse ratchet-wheel R, with its pawls Y and Y', sprocket-wheels C and B', and an endless sprocket-chain L, having a pulley K, with a weight W, attached thereto, swung in said sprocket-chain between said sprocket-wheels, substantially as described, and for the purposes set forth.

4. In a motor, an endless sprocket-chain having a pulley K', with a weight W' swung in said sprocket-chain, said weight and pulley operating to take up the slack of said sprocket-chain, in combination with carrying-pulleys P P P, journaled on the frame-work A, substantially as described, and for the purposes set forth.

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