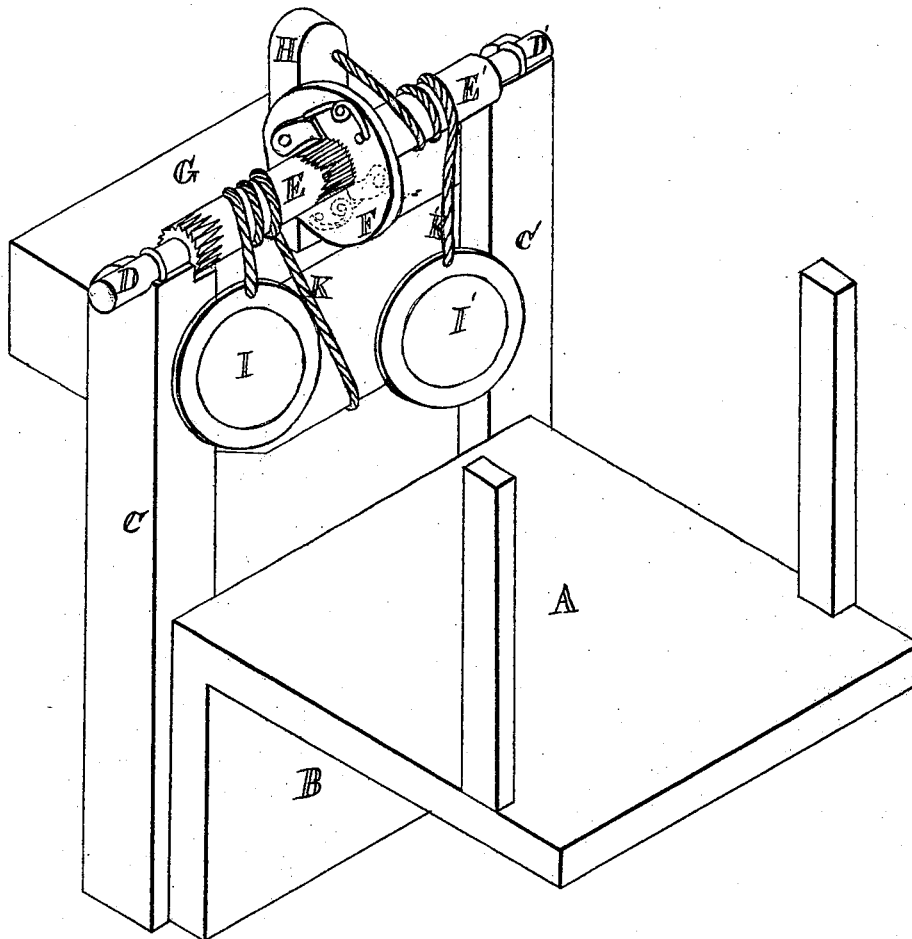


W. R. Close,

Tide Power.

No. 110436.

Patented Dec. 27, 1870.



Witnesses
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WALTER R. CLOSE, OF BANGOR, MAINE.

Letters Patent No. 110,436, dated December 27, 1870.

IMPROVEMENT IN TIDAL MOTIVE-POWERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WALTER R. CLOSE, of Bangor, in the county of Penobscot and State of Maine, have invented a certain new and useful Method of Deriving Motive-Power from the Rise and Fall of Tides; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The nature of my invention consists in taking advantage of the rise and fall of the tides to automatically move machinery for ordinary mechanical purposes.

The accompanying drawing is a perspective view of that part of the machine which is essential to obtaining power; A representing the top, and B the upright face or front of a wharf or pier.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

I construct or use a wharf or pier, as A B, where the tide rises and falls, and fasten the upright beams or standards C C' to the face of the wharf, as at B.

On the top of the standards I fix boxes for and support the shaft D D'.

I provide a collar, F, and key it onto the middle of the shaft; or there may be two collars placed at the ends of the shaft, if desirable or more convenient.

I construct the two cylinders E E' of the proper size to fit onto the shaft D D', and easily revolve around it, and on that end of each cylinder which will be in contact with the collar, whether one or two collars be used, I make grooves or form a ratchet.

I provide a pawl, c, and attach it to the collar F in such a manner that it may fall into the ratchet-grooves on the cylinder E or E', and I attach a spring, d, in such a manner as to force the pawl c into the ratchet as it revolves. This spring I should expect to vary to suit circumstances, and might find it necessary sometimes to use a spiral spring, and sometimes to use rubber.

When the collar is in the middle of the shaft the pawls to act on the two cylinders would be placed on opposite sides of the collar, and the dotted lines represent c', which would represent c' acting in connection with E'.

I provide a floating weight, G, whether constructed for the purpose or obtained by using any ordinary floating craft loaded to the proper weight, and supply it with the mast H, (or, if desirable, can fasten a pulley to the wharf, and pass the rope or chain around it and onto the deck of the floating craft, without the use of the mast H,) and attach a rope or chain, K', which I pass a few times around the cylinder E', as shown, and I attach a weight, I, which shall be heavy

enough to revolve the cylinder E' and take up the slack of the chain or rope as the weight descends, thus preventing any jar when the craft commences to ascend.

I also provide a similar arrangement on the cylinder E, and attach the rope to the bottom of the craft. I coil this rope or chain K around E in an opposite direction from the coil on E'.

The weights I I' may be dispensed with, when desirable, by fastening the weight end of K' at a', and fastening the weight end of K at b. This method of fastening both ends enables this machine or device to be used to drive a balance-wheel from the motion of a piston-rod, or it furnishes a method of changing reciprocating into rotary motion.

In operation I arrange all the parts in the relative positions shown in the drawing.

The craft G is afloat, and the tide rises, carrying up the mast H. This draws the rope K, and the pawl c' being in position, the cylinder revolves, carrying with it the shaft D D', both revolving toward the craft; at the same time, as the craft G rises, the weight I draws upon the rope K, and revolves the cylinder E in the direction opposite to the revolution of E', while the pawl c catches and holds the strain of the rope K, preparatory to the fall of the tide. The tide now falls, and G descends and draws upon the rope or chain K, causing E to revolve toward the craft, and carry the shaft D in the same direction, thus keeping the revolution of the shaft D D' continuous in the same direction it revolved while the tide was rising.

This arrangement prevents the possibility of the shaft revolving in the opposite direction from the desired one.

Thus it will be seen that the machine may be set in motion, and it will run without watching or tending as long as the tide rises and falls, if desired, unless interrupted by accident.

The importance of this invention can hardly be estimated, for it abolishes all accident by explosion, all damage from fire, all expense of fuel, all expense of tending, and all wearing out of boilers, the only expense being that of the first construction and such trivial repairs as may be necessary.

This power is faster or slower in proportion to the greater or lesser rise and fall of the tides, but it can be increased by gearing; and the original power is great, and can be augmented by allowing the machine to run during the night-time and hoist weights which may be used in connection with the tide-power during the following day. In this way, also, a continuous power may be obtained in places where the tide leaves the bottom dry for a portion of the time.

This power is so cheap, constant, and so readily

available that it may be used in manufactures and operations which will not pay the expense of using steam-power, and cannot profitably be carried to the location of ordinary water-powers.

What I claim as my invention, and wish to secure by Letters Patent, is—

1. Obtaining a continuous revolution of a shaft, in a desired direction, by means of the cylinders E E', revolving in alternate directions on the shaft D D', and acting in connection with the stationary collar F,

pawls c c', springs d d', and ropes or chains K K', all as shown and described.

2. The cylinders E E', in combination with the shaft D D', collar F, pawls c c', springs d d', ropes or chains K K', with the weights I I', floating weight or craft G, and the upright posts or standards C C', all as shown and described.

Witnesses:

J. E. M. SANFORD,
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W. R. CLOSE.