

M. V. B. ETHRIDGE.
WATER CURRENT POWER TRANSMITTER.

No. 382,959.

Patented May 15, 1888.

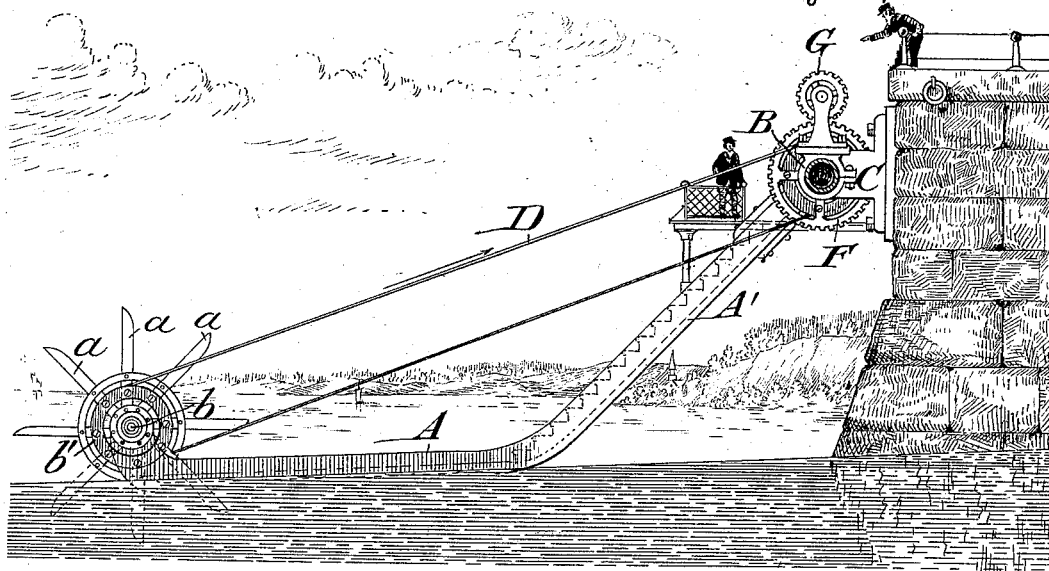


Fig. 1.

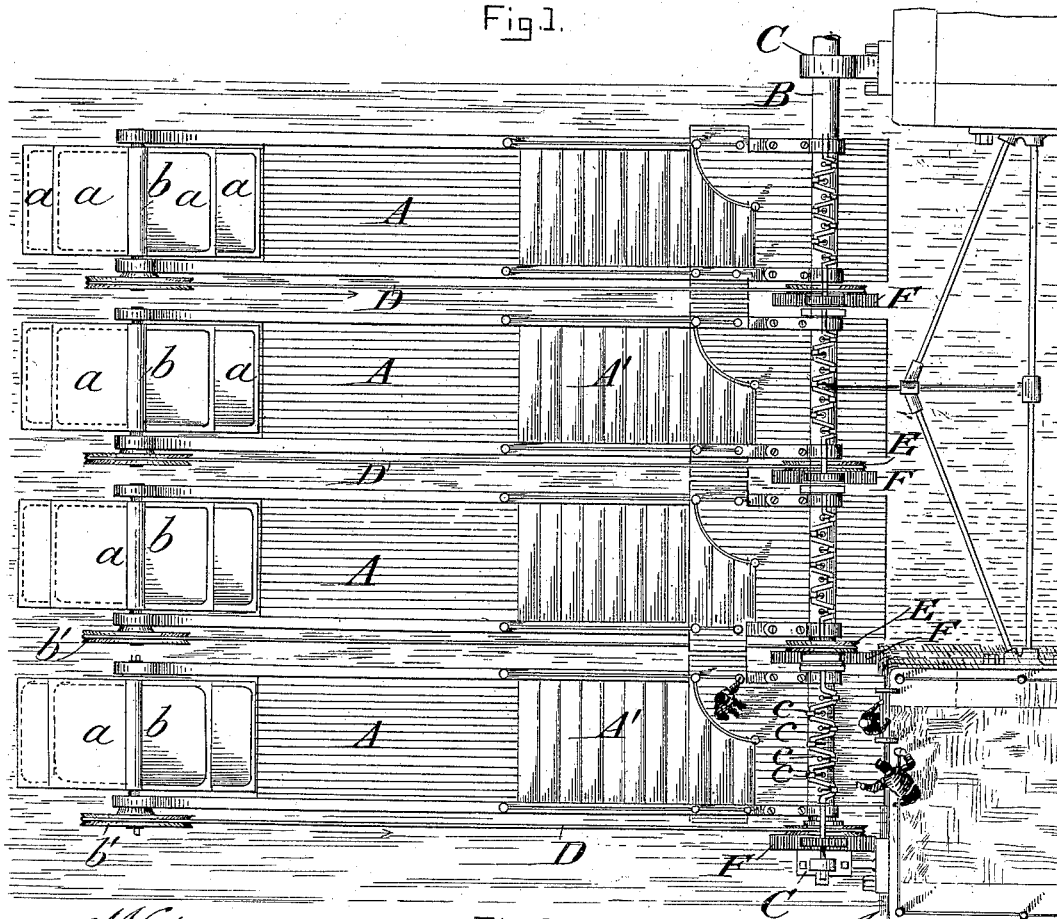


Fig. 2.

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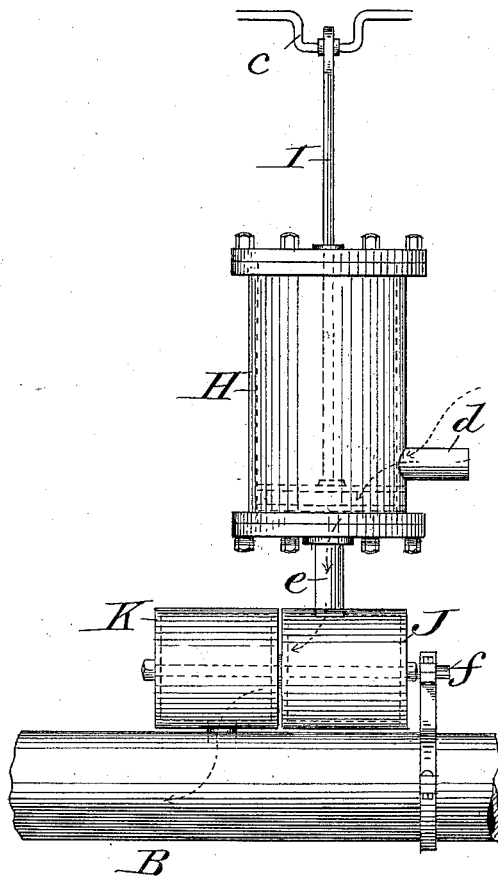


Fig. 3.

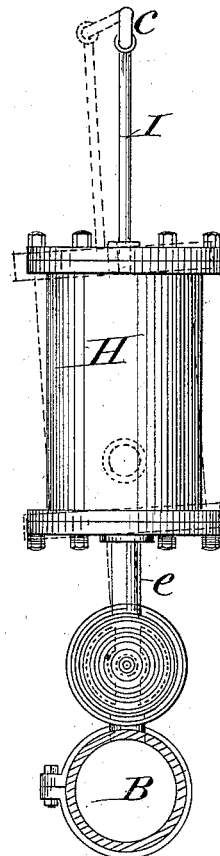


Fig. 4.

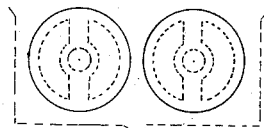


Fig. 5.

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UNITED STATES PATENT OFFICE.

MARTIN V. B. ETHRIDGE, OF BOSTON, ASSIGNOR OF ONE-HALF TO HENRY E. WAITE, OF WEST NEWTON, MASSACHUSETTS.

WATER-CURRENT-POWER TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 382,959, dated May 15, 1888.

Application filed November 11, 1887. Serial No. 254,924. (No model.)

To all whom it may concern:

Be it known that I, MARTIN V. B. ETHRIDGE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Water-Current-Power Transmitters; 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 an improvement in mechanism for transmitting power from the current of the water flowing in a river or other stream, for the purpose of actuating an air-pump or other device; and it consists in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the annexed drawings, illustrating my invention, Figure 1 is a side elevation of an abutment and of my improved water-current power located in connection therewith. Fig. 2 is a top plan view of the same. Fig. 3 is an enlarged side elevation of the air-pump, its operating-crank, and a portion of the air-pipe. Fig. 4 is a similar side elevation at right angles to that in Fig. 3, the oscillation of the pump-cylinder being shown in dotted lines. Fig. 5 is an outline view of the swiveled portions of the pump, the left one being affixed to the pipe shown in Fig. 3 and the other to the pump.

Similar letters of reference denote corresponding parts in all the figures.

A designates a float. This is constructed in any desirable manner to suit the purposes for which it is to be used, and it preferably has an extension, A', which is hung loosely upon a horizontal pipe, B, serving as a shaft suspended over the stream in suitable bearings or supports, C C, fixed on stone abutments on the shore or other proper sustaining devices. In the drawings I have shown a series of four of these floats, all hung upon the same shaft, B. The number of them, of course, is immaterial and forms no part of my invention, which resides in the construction and arrangement of a single one, to which my description herein will in the main be confined.

It will be obvious at a glance that the floats

will rise and fall with the change of the water-level consequent on various causes.

Journaled in suitable bearings on the float in such a manner as to be rotated by the current of the stream is a water-wheel of suitable construction, the ordinary form with radial vanes or arms *a a* arranged upon a shaft, *b*, being adopted for representation in the drawings as an example of my invention. The shaft of the water-wheel carries a pulley, *b'*, from which by a belt, *D*, motion will be communicated to a pulley, *E*, on shaft or pipe *B*, said pulley *E* being rigid to a gear, *F*, likewise on pipe *B*. Thus it is obvious that the belt *D* will drive the gear *F* at all times whatever may be the water-level, for the float will rise and fall without disturbing the driving mechanism. Gear *F* meshes with a gear, *G*, vertically above it, the shaft of which is journaled in standards, as shown, and is a crank-axle consisting of a series of cranks, *c c c*, for driving a mechanism attached thereto.

In Figs. 3 and 4 I have represented one form of this attached mechanism, consisting of an air-compressing pump. *H* represents the cylinder, having an inlet-valve, *d*, for the admission of air. Within the cylinder is a piston operated by a piston-rod, *I*, which emerges from a central opening in the upper head of the cylinder, and is connected to and driven by the crank-axle. Below the cylinder *H* is a short pipe, *e*, having a valve and connecting the cylinder with a horizontal cylinder, *J*, arranged on shaft *f* to swivel with a similar cylinder, *K*, rigidly fixed upon and communicating with pipe *B*. The two opposing faces of cylinders *J* and *K* are provided with ports, as shown in outline in Fig. 5, which communicate. As the crank-axle revolves, the piston and its rod reciprocate and oscillate also, as shown in dotted lines in Fig. 4, and likewise the cylinder *H* and cylinder *J* oscillate. The parts are so arranged and the valve between cylinders *J* and *K* is so adjusted that on the down-stroke of the piston air will be compressed and driven through *K* into pipe *B*; but as soon as the piston begins its upstroke the oscillation consequent thereon will move cylinder *J* sufficiently to close the entrance to *K*, and thus prevent exhaustion of the air therein.

Having thus described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

1. The herein - described water - current-power transmitter, consisting in the combination of a swinging float, a stationary air-pipe on which one end of the float is hung, a water-wheel carried by the float, suitable gears on the air-pipe, an air-compressing mechanism connected to said gears, and a driving-belt between the water-wheel and the gears for actuating the latter to drive the said mechanism and compress air into the air-pipe, substantially as described.

2. The combination of the swinging float A, the stationary support B, on which one end of the float is hung, the gear F on the support B and carrying pulley E, the water-wheel on the float having pulley *b'*, and the belt-connection D between pulleys *b'* and E, all arranged to operate any desired mechanism, substantially as described.

3. The combination of a swinging float, a water-wheel thereon, an air-pipe, B, on which the float is hung, said pipe resting on supports on the shore, a crank-axle, *c*, actuated by connection with the water-wheel, the swiveling cylinders J K, carried on pipe B and com-

municating therewith, air-compressing cylinder H, communicating with said cylinders J K, and the pitman I, connected to crank-axle *c*, for operating a piston in cylinder H, all substantially as described.

4. The combination of a swinging float, a water-wheel thereon, an air-pipe, B, on which the float is hung, said pipe resting on supports on the shore, the gear F on pipe B, rigid to pulley E, likewise on said pipe, the gear G, meshing with gear F, crank-axle *c*, carrying the gear G and suitably journaled, the belt D, whereby the water-wheel actuates the pulley E and other mechanism, the swiveling cylinders J K, carried on pipe B and communicating therewith, air-compressing cylinder H, communicating with cylinders J K, and the pitman I, connected to the crank-axle *c* and a piston within cylinder H, all arranged to operate substantially as described.

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

MARTIN V. B. ETHRIDGE.

Witnesses:

CHAS. HALL ADAMS,

STEPHEN W. TROWBRIDGE.