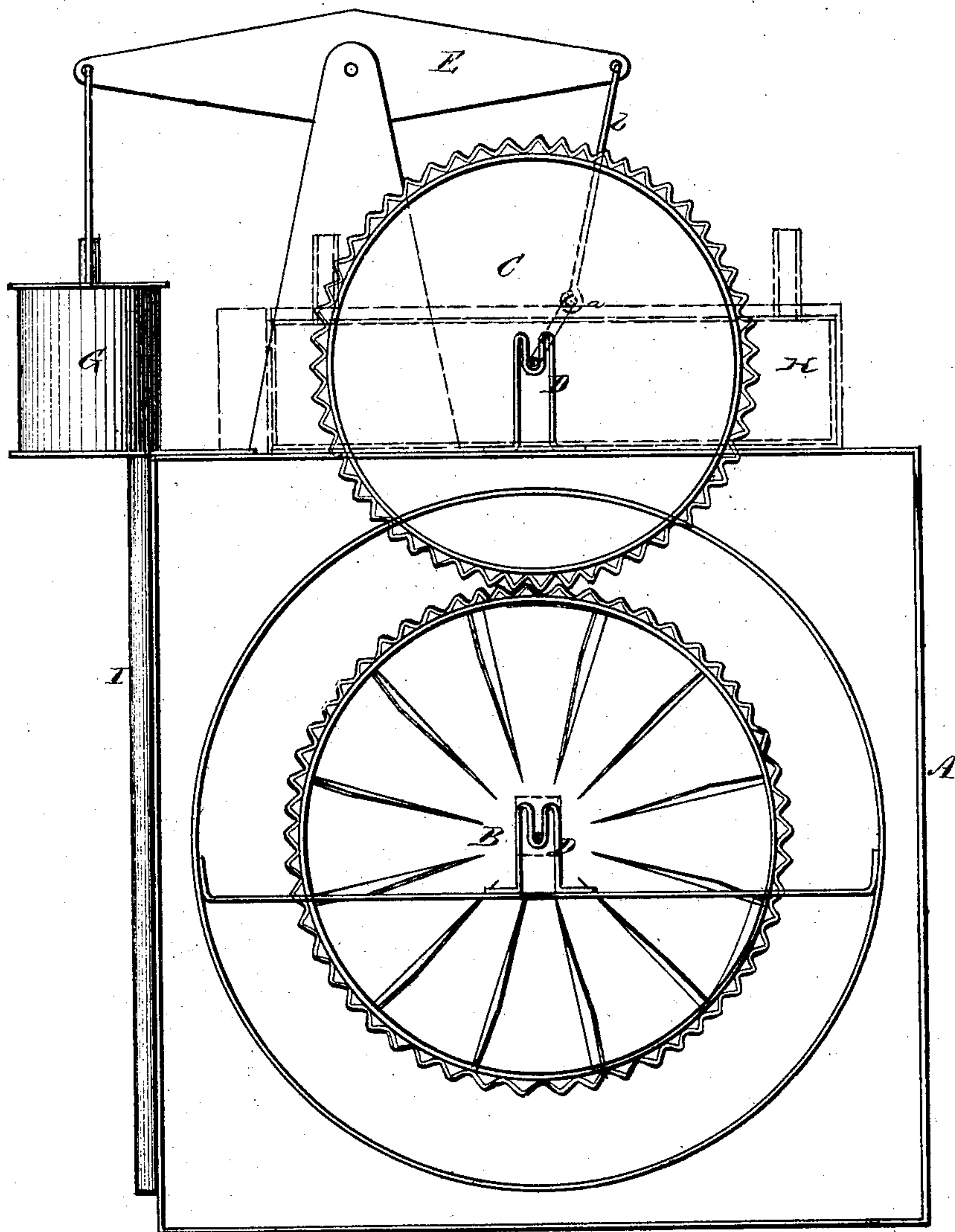


H. Spear,
Compressing Air.
No. 100,946. Patented Mar. 15. 1870.



Witnesses
John A. Ellis,
J. W. White

Inventor
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Per
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Atty.

United States Patent Office.

HATHERLY SPEAR, OF CAPE ELIZABETH, MAINE.

Letters Patent No. 100,946, dated March 15, 1870.

IMPROVEMENT IN COMBINED CURRENT-WHEELS AND CONDENSING-ENGINES.

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, HATHERLY SPEAR, of Cape Elizabeth, in the county of Cumberland, and State of Maine, have invented certain new and useful Improvements in Tidal Vessels for Condensing Air; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in the construction and arrangement of a device by the use of which the power of running streams can be readily utilized and transmitted to any point desired, without the aid of mill-dams or any of the usual expensive contrivances.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, which represent a transverse vertical section of my machine.

A represents a hollow case or box, square on the outside but round on the inside, it being in fact a square box open at both ends, inside of which is placed a cylinder, the space between the two being closed up so as to form an air-tight chamber. The case A is made so as to withstand a considerable pressure. At one end it is provided with a flaring mouth.

Within the case A is placed a water-wheel, B, so constructed that if the case is submerged in a running stream the water will turn the wheel.

On the outside of the rim of the wheel B are cogs, which gear with a cog-wheel, C, mounted upon a shaft having suitable bearings in standards D D on top of the case, and the wheel C projecting downward through an opening in the same.

Upon the end of the shaft on which the cog-wheel C is placed, is a crank, *a*, and this crank is, by a rod, *b*, connected with one end of the walking-beam E, the other end of said beam being connected with the piston of an air-condensing engine, G.

The condensing-engine G is by a tube connected with a receiver, H, and from this receiver the condensed air is conducted through suitable conduits to any point desired.

A governor is also attached to the case A, through which the condensed air may pass, when desired, into the case A.

The machine thus constructed is sunk in a stream at any point desired, by allowing water to pass into the case A through an opening in the bottom, said opening being provided with a valve that can be opened and closed at will from the top.

The case should not be sunk more than to the top of the wheel, and to prevent this, condensed air is ad-

mitted into the case until it obtains the desired position. It is then secured by means of posts driven through tubes I at one or more of its corners. Or, in case the tide effects the stream in which it is placed, it may be anchored so as to always present its mouth to the stream or current.

The water now passing through, sets the wheel B in motion, and this by the means of the cog-wheel C and walking-beam E operates the condensing-engine G, the condensed air being carried off to any point where it is intended to be used, after first having passed through the receiver H.

This receiver may be made in various ways, and I do not now lay claim to any particular mode of constructing the same. I will, however, here remark that in places where iron is scarce but lumber plentiful it may be made of wood in such a manner as to withstand all the pressure it is intended to be subjected to.

If at times the power of the current should be found to be great, the case can be readily raised up to a certain height, lessening the power or speed of the water-wheel by the diminished quantity of water acting upon the same. The surplus power contained in the receiver is at such times brought into requisition, as will readily be understood.

The machine can readily be raised by the admission of condensed air into the case, so that it can be taken over shallow places, and submerged again wherever desired.

By considering the immense amount of power that is daily and hourly going to waste in our rivers and streams, the advantages of this machine will be readily appreciated.

It is not necessary to build any mill-dams or have any fall of water. Anywhere where a stream is deep enough to submerge or even partially submerge my machine it can be applied, and by the use of one machine enough power can be obtained to run a number of mills, &c.

In rapid streams or shallow rapids I may add wheels outside of the case, and also have more than one condensing-engine, so that the power of the current will be fully utilized. In this case, if it should be desired to use only a small amount of condensed air, one engine only may be allowed to condense the air while the others do not, although the entire machinery is in operation, and hence there will be no more air condensed than what is necessary for the purposes desired.

I do not confine myself to any particular form or shape of the water-wheel or wheels used, as they may be constructed in any manner deemed most advantageous. Neither do I confine myself to any particular governor, although it is my intention more particularly to use the governor patented by Robert Spear, Novem-

ber 30, 1869, as I consider that the best for the purpose.

The case A need not be constructed in precisely the shape above described. It may be formed in any manner, only so as to be hollow, or have a chamber to hold water or compressed air, or both.

Having thus fully described my invention,

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

The combination and arrangement of the case A,

water-wheel B, cog-wheel C, walking-beam E, condensing-engine G, and receiver H, all substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

HATHERLY SPEAR.

Witnesses:

T. H. ALEXANDER,
JOHN A. ELLIS.