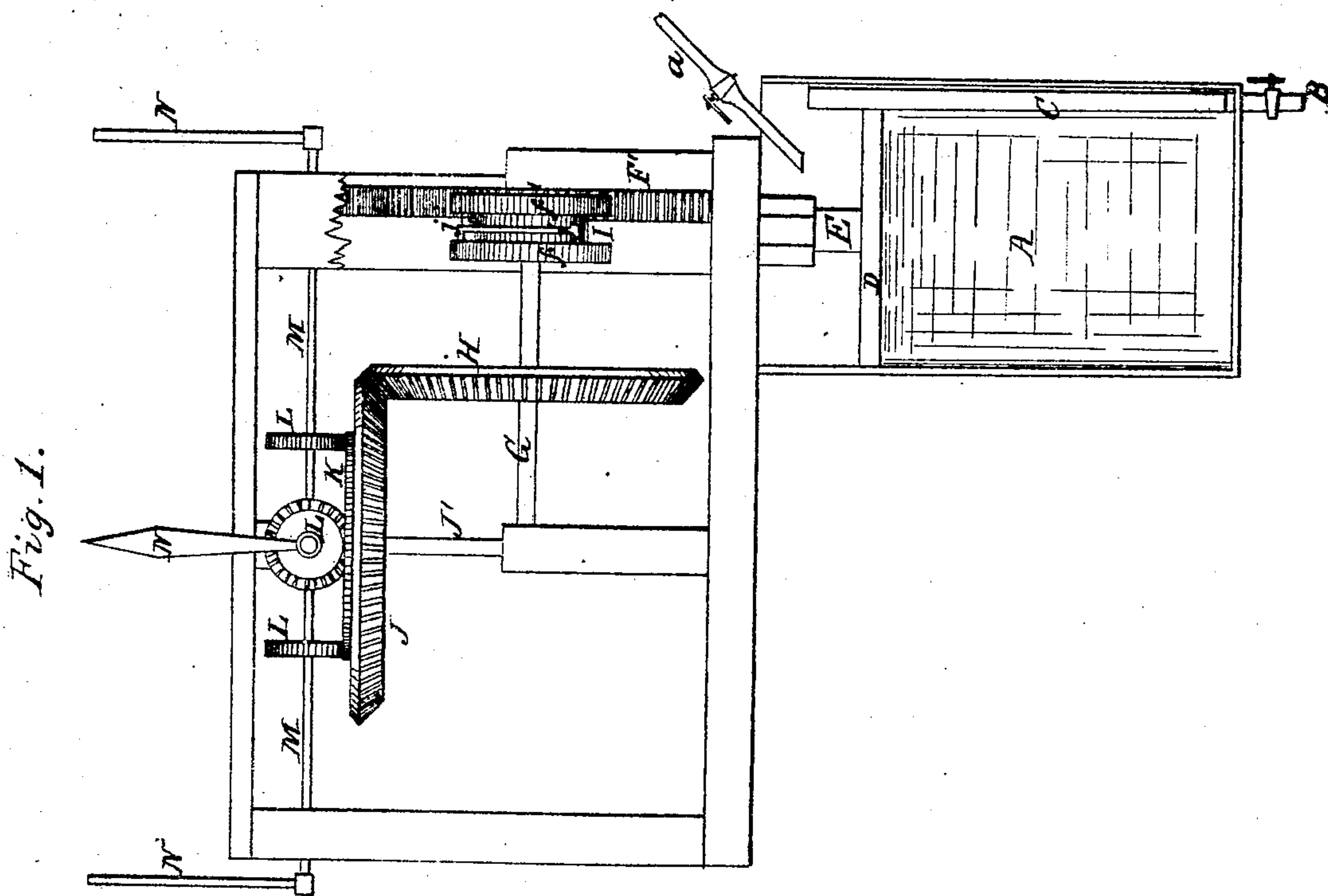
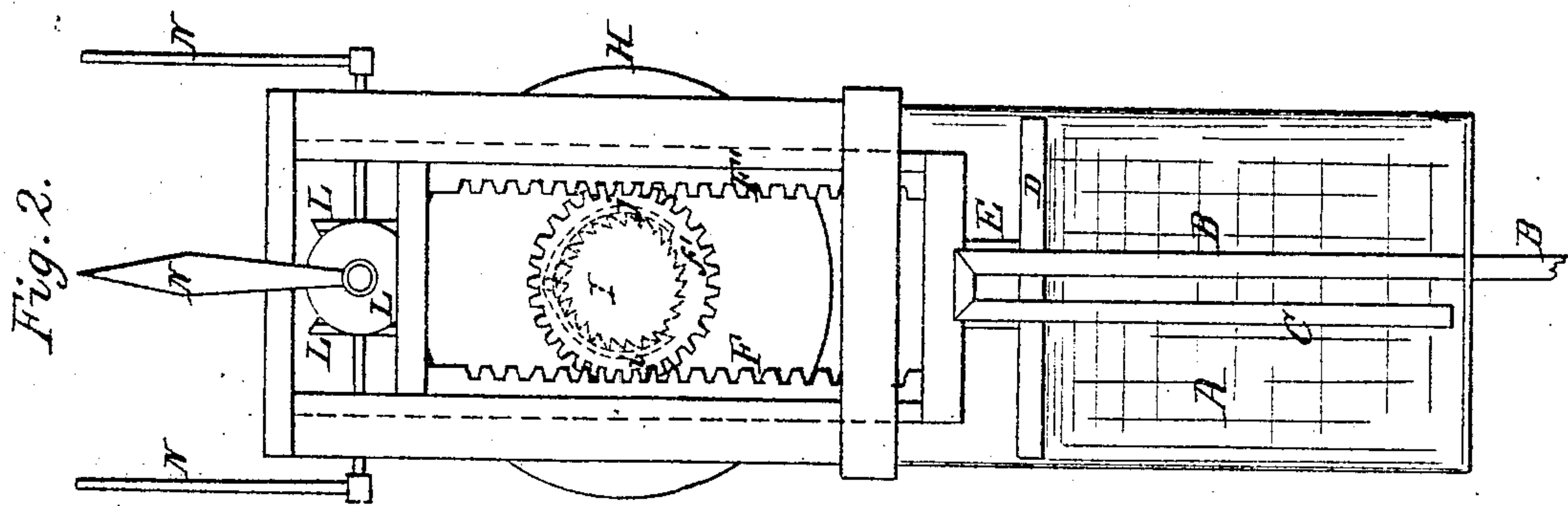


O. Abbruzzo.
Hydraulic Clock.
N^o 71437 Patented Nov. 26, 1867.



WITNESSES.

Wm. A. McKenney.
J. McKenney.

INVENTOR

Orofio Abbruzzo.
By Miedersheim & Co

United States Patent Office.

ONOFRIO ABBRUZZO, OF ST. MARGHERITA, ITALY.

Letters Patent No. 71,437, dated November 26, 1867.

IMPROVEMENT IN HYDRAULIC CLOCKS.

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, ONOFRIO ABBRUZZO, of St. Margherita, in the province of Girgenti, in Sicily, and Kingdom of Italy, have invented a new and useful Improvement in Hydraulic Clocks; and I do hereby declare the following to be a full and correct description of the same, sufficient to enable others skilled in the art to which my invention appertains to fully understand and use the same, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 is a side elevation of my improved hydraulic clock, and

Figure 2 is an end elevation of the same.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists in providing a vessel, of any regular shape and size, with an intermittent siphon, which will allow the water admitted to rise and fall within the vessel, and act, through a float and suitable gearing and wheels, on the hand of a clock, giving the same regular motion.

A, in the drawing, represents a vessel of cylindrical form, which has a siphon secured to its inner side, the longer arm B of which passes through the bottom of the cylinder, whilst the shorter arm C reaches near enough to the same to allow always a little water to remain in the cylinder, and prevent dust or stones from choking up the siphon. A pipe, *a*, conducts water from any convenient source into the cylinder A, and is so constructed that it only admits one-half of the volume of the water which is taken out by the siphon; that is to say, if the siphon discharges two gallons of water per hour, the pipe *a* admits only one gallon during the same time. On the water in the cylinder A rests a float, D, bearing a standard, E, on which is formed a double rack, F F', the rack F gearing with a toothed wheel, *f*, and the rack F' with a toothed wheel, *f'*. These wheels *f f'* play loosely on the shaft G, which bears the gear-wheel H. Between the wheels *f f'*, keyed on the shaft G, is a pinion, I, operated by pawls *i* and *j*, on the wheels *f* and *f'* respectively, so that, whichever way the wheels *f* and *f'* are turned by the racks F F', the pinion I will always be turned in the same direction by them alternately. Instead of having one pinion common to them, the wheels *f f'* may each be provided with a pinion separately. The vertical gear-wheel H meshes with a horizontal gear-wheel, J, on a shaft, J', and on the surface of which is a circular rack, K, which moves four small wheels, L, which are keyed on shafts, M, on the ends of which the hands N of the clock are secured.

When water is admitted into the cylinder A, by means of the pipe *a*, the siphon does not begin to act until the water has reached the top of the bent part of the siphon. As soon as the water has reached this point, it is drawn off by the siphon in exactly double the quantity as it is supplied by the pipe *a*, so that while all the water admitted by the pipe *a* during a certain time is drawn off, an equal quantity of the water already in the cylinder will be drawn off also during the same time, and the water will have fallen a certain distance in the cylinder; or, while the siphon is drawing from the cylinder a certain quantity of water contained in the cylinder, it at the same time draws an equal quantity or volume of water which is constantly admitted by the pipe *a*. Thus the float D is forced downward, and, operating on the different wheels as described, moves the hands N gradually and continually.

When the water has sunk below the mouth of the shorter arm of the siphon, the atmosphere, rushing into the same, will fill that vacuum, and prevent the siphon from acting until the cylinder has again been filled to that point where the weight of the atmosphere and the water force the siphon to act again. During this filling of the cylinder the float D rises again and operates the rack F F', which moves the hands N in the same direction as before. As soon as the siphon begins to act again, the float will fall again, and the operation continues as long as the water is allowed to flow into the cylinder through the pipe *a*.

The time of one revolution of the hands N is regulated by certain contrivances on the pipe *a*, as well as the mouth of the longer arm B of the siphon, by means of which the flow of water can be perfectly regulated.

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

Producing the regular motion of the hands of a clock by means of the regular and continuous rise and fall of water in a single vessel, provided with a single intermittent discharging siphon, and having a continuous influx of water, which influx is in relation to the discharge in the ratio of one to two, substantially as described.

To the above I have signed my name, this 14th day of September, 1867.

ONOFRIO ABBRUZZO.

Witnesses:

JOHN A. WIEDERSHEIM,
D. OURAND.