[118.]

T. J. LOVEGROVE. Patented Dec. 12, 1871.

Improved Water Elevator.

No. 121,793.

Fig. 5.

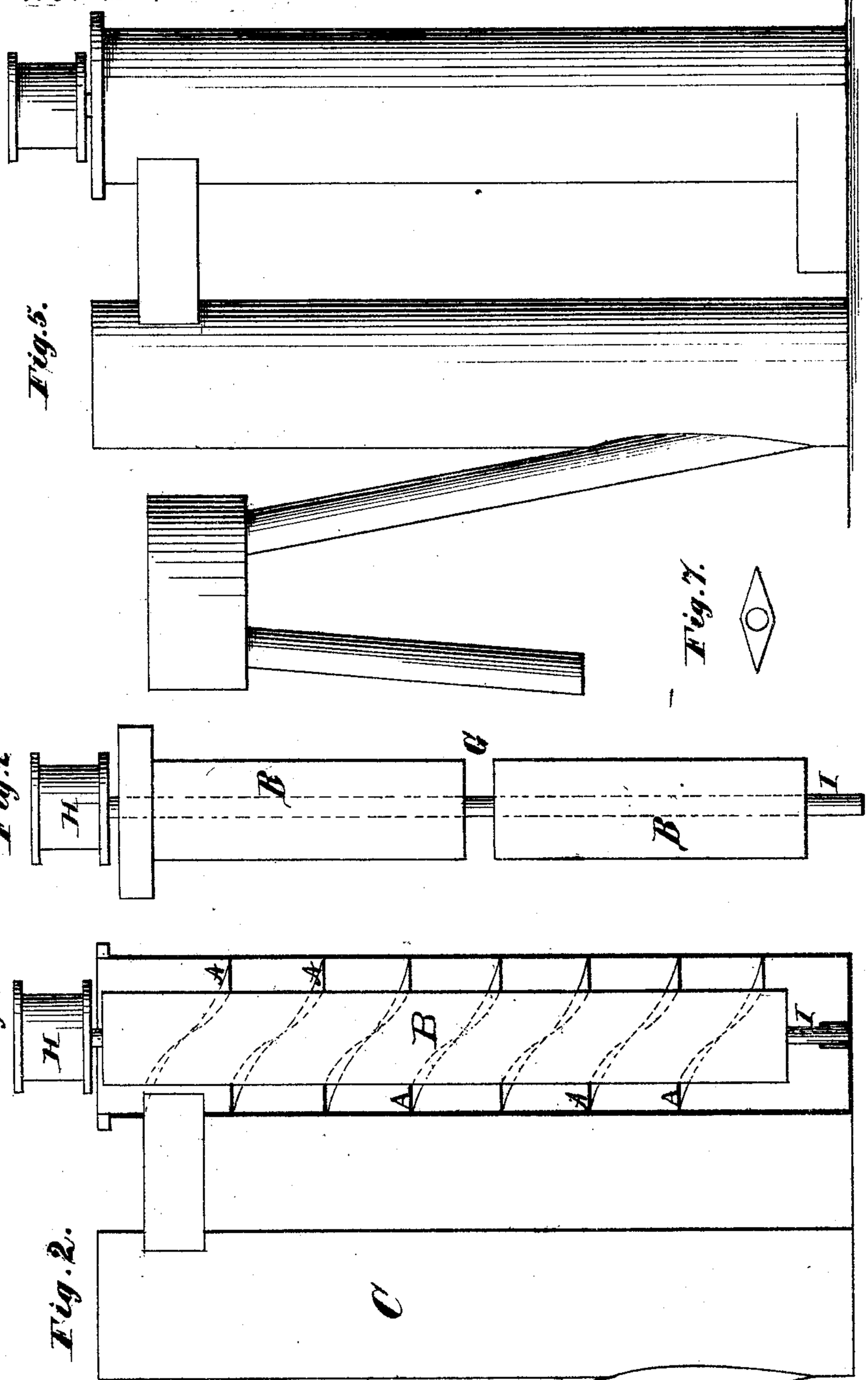


Fig. 7.

Fig. 6.

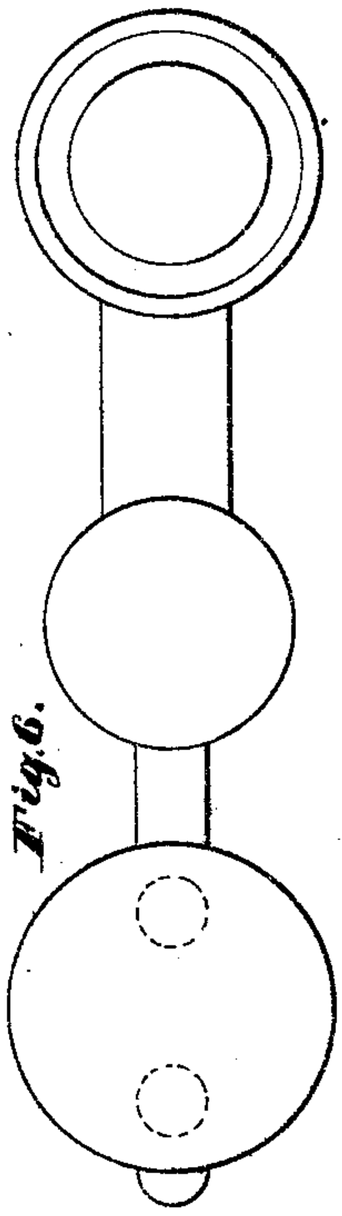
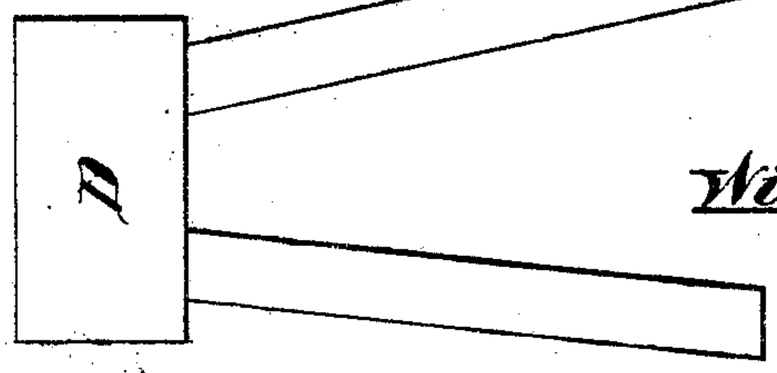


Fig. 4.

Fig. 1.

Fig. 2.

Fig. 3.



Inventor.

T. J. Lovegrove.

Witnesses.

John Bastian

J. R. Hayes.

121,793

UNITED STATES PATENT OFFICE.

THOMAS J. LOVEGROVE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY S. LANSING, OF SAME PLACE.

IMPROVEMENT IN ROTARY PUMPS OR WATER-ELEVATORS.

Specification forming part of Letters Patent No. 121,793, dated December 12, 1871.

To all whom it may concern:

Be it known that I, THOMAS J. LOVEGROVE, of the city and county of Philadelphia and in the State of Pennsylvania, have invented a new and useful Improvement in Liquid Elevators and in Stand-Pipes; and I do hereby declare that the following is a full, clear, and exact description of the operation and construction of the same, reference being had to the annexed drawing making a part of this specification, and in which—

Figure 1 is a vertical section of the elevator. Fig. 2 is a stand-pipe in connection with same. Fig. 3 is a reservoir. Fig. 4 is a revolving blade. Fig. 5 are elevator, stand-pipe, and reservoir in elevation. Fig. 6 is a view from the top. Fig. 7 is a view of end of revolving blade.

The mode of constructing my improved water-elevator is to make a stand-pipe or elevator, on the inside of which is an inclined plane or thread, A, Fig. 1, inside of which a revolving blade or fan, B, Fig. 4, is placed, which revolves at a velocity sufficient at each impulse to raise the water to a height equal the greatest diameter of the elevator. Each length of the blade equal to the diameter of the elevator creates centrifugal force and velocity to elevate the water on the circular inclined plane to a height equal to the greatest diameter of the elevator. Thus the water is elevated from one section to another, and so on to the top of the elevator, by each succeeding length of the blade equal to the diameter. To keep the blade steady and in position for a long elevator it is cut in two and provided with bearings twenty feet, more or less, apart, G, Fig. 4. This blade or revolving fan is driven from the top H or bottom I of the elevator, as may be most convenient.

It is evident that when the water is elevated by the centrifugal force and velocity given to it by this revolving blade on the inclined plane or thread (which is also continuous to the top) that power is saved for the reason that there can be no impinging of the water on the sections.

It will be seen by this arrangement of the blade, which is not in any sense of the word a propeller, that no heavy pressure will be generated at the top or bottom of the blade. The whole duty of the blade is to rotate the water.

The stand-pipe C used in connection with this elevator is of the ordinary kind, except that it is so constructed as to receive the water from the top of the elevator and force it by its gravitation to the reservoir D or line of supply, which may be placed near or distant from pipe C. In the use of the ordinary stand-pipe it is intended to relieve the hydraulic engine of the strain necessary to drive the water at the same speed of the piston through thousands of feet or miles of pipe laid from it to a reservoir. In it the water is allowed to run up the pipe at each stroke of the pump; but before the descent is complete the descending column is met by the ascending column, and by the collision of the two currents it is evident a large amount of power is wasted, all of which my improvements obviate. This will be more clearly shown in the following description: My improved elevator causes the water to revolve until an amount of centrifugal force and velocity is generated to elevate the water on a circular inclined plane or thread at each impulse to a height equal to the largest inside diameter of the pipe, and with a continuous upward movement to any required height; thus the maximum pressure in the first pipe is only equal to a column of water whose height is equal to the diameter of the pipe. If the pipe were four feet in diameter the greatest pressure in the first pipe would only be two or three pounds, and the elevating machinery would only contend with that amount of pressure at each four feet of its height. Therefore, while the pressure in the first pipe would be merely nominal, that in the second pipe would be equal to the gravity of a column equal to its entire height. Under such a heavy pressure the water must necessarily flow from the second stand-pipe to the reservoir or line of supply, while it could not thus flow from the base of the first pipe with its elevating machinery. It follows that in the stand-pipe now in use with a divided pressure, created by an ascending and descending current, it could not flow as readily nor with the pressure obtained by me in the use of this second pipe.

I am aware that a conical vessel with an internal web or spiral and revolving blade has been used for discharging water by centrifugal

force generated by the revolution of the blade, as in the rotary pump patented to Barnes, March 20, 1849; and I, therefore, do not claim, broadly, the construction of a vessel having an internal spiral and a propelling blade; but

I claim—

A water-elevator, consisting of a cylindrical vessel having an internal spiral web and a central rotating shaft provided with vanes, and operating substantially as described.

T. J. LOVEGROVE.

Witnesses:

J. R. HAYES,

JOHN BASTIAN. (118)