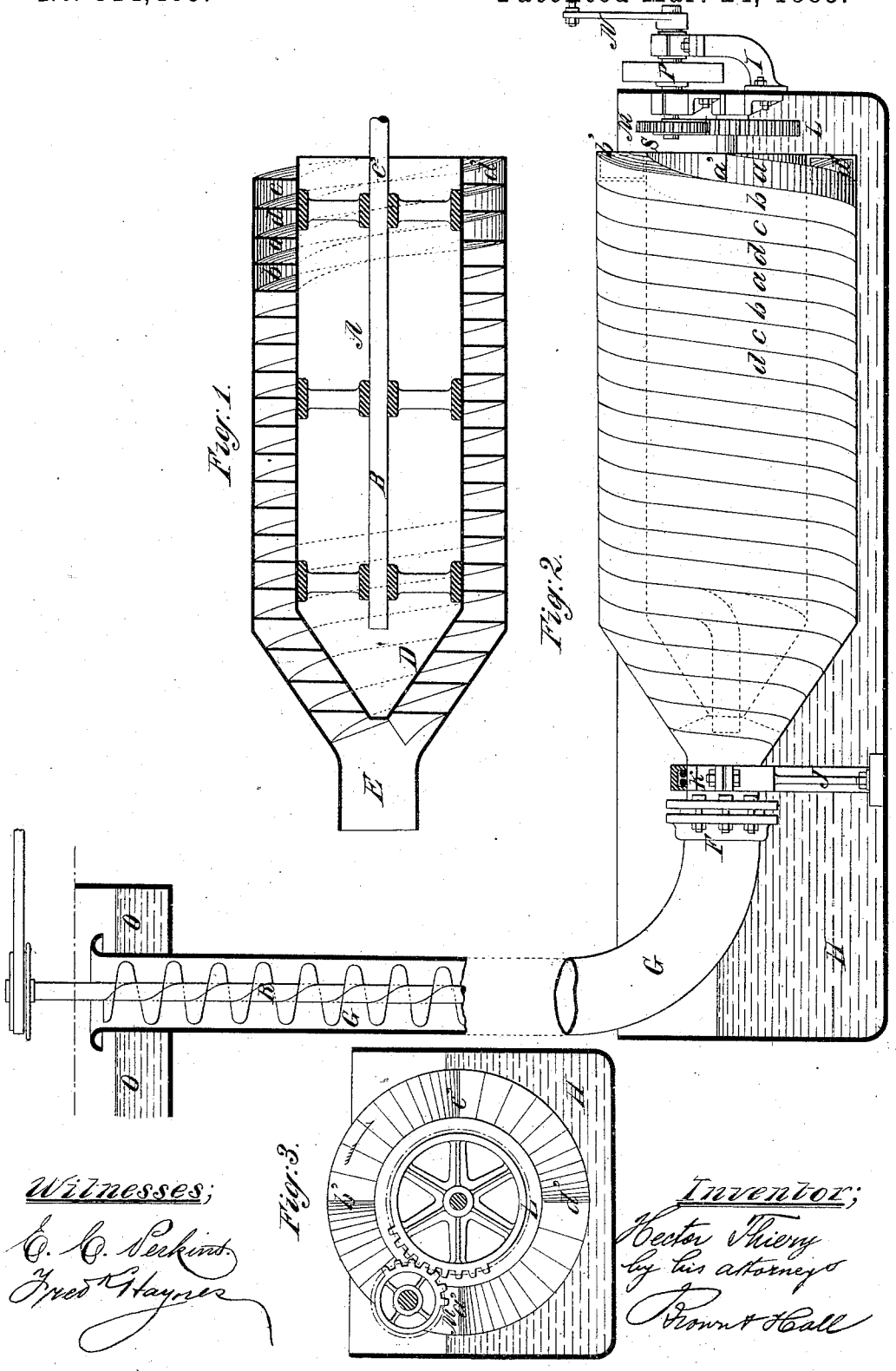
(No Model.)

H. THIERY.

APPARATUS FOR PROPELLING FLUIDS.

No. 314,489. Patented Mar. 24, 1885.



Witnesses;
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UNITED STATES PATENT OFFICE.

HECTOR THIÉRY, OF PARIS, FRANCE.

APPARATUS FOR PROPELLING FLUIDS.

SPECIFICATION forming part of Letters Patent No. 314,489, dated March 24, 1885.

Application filed December 9, 1884. (No model.) Patented in France March 12, 1883, No. 154,256.

To all whom it may concern:

Be it known that I, HECTOR THIÉRY, of Paris, in the Republic of France, have invented a new and useful Improvement in Apparatus for Raising Fluids, (for which I have obtained a French Brevet d'Invention No. 154,256, dated March 12, 1883,) of which the following is a specification, reference being had to the accompanying drawings.

This invention consists, essentially, in one or more tubes of any transverse sectional form coiled any number of times in a spiral form around a horizontal cylindrical body having a conical end, upon which the tubes are also coiled. The two extremities of the spiral tubes thus arranged are open, and the said tubes debouch at their inlet ends on the circumference of the cylinder, and at their outlet ends where they follow the conical surface they converge to the center of the apparatus, where they communicate with a common outlet-pipe, which rises vertically and terminates in a collecting-reservoir arranged for the purpose. This apparatus being half immersed in water and having a rotary motion imparted to it in the proper direction, there enters at each revolution into the spiral tubes equal volumes of water and air, and by reason of the revolution of the apparatus and of the continued entrance of the liquid into the spiral tubes, the air which is caused to be imprisoned in the tubes is compressed in the successive spirals thereof, and reacts in its turn on the liquid on the discharge side, where it escapes with the liquid by the outlet-conduit above mentioned.

By observing attentively the passage of the fluids in this apparatus, it may be understood that in the conical part, the length of the spirals being reduced, the volume of water which is engaged in each leaves but small space for the air, which is thus compressed in a certain degree. On the other hand, the water which is contained in the cylindric spirals leaves no passage for the air in the other direction; but the planes of the levels of the extremities of each of the volumes of liquid imprisoned in these spirals are raised progressively in such manner that the maximum pressure that can be obtained depends on the diameter of the apparatus and upon the number of spirals provided upon it.

In case it is desired to elevate water to a height greater than can be done by one apparatus of this kind, I may either superpose several similar apparatuses acting successively on the liquid, or I may arrange in a column of ascension communicating with the outlet-conduit a vertical helix having a rotary motion, which would permit the raising of the water to any height. In this case the compressed air in the outlet-conduit at the base of the said helix will, by its expansion to the atmospheric pressure, communicate to the water in the column the work which has been employed to compress it in the spiral tubes.

In case it be desired to collect and utilize for any other purpose the air compressed in this apparatus, all that is necessary is to place at the base of the outlet-conduit and upon its horizontal part a vertically-placed air-receptacle, whence the air may be taken from its upper part.

The accompanying drawings illustrate an example of my apparatus, in which are four spiral tubes arranged, as above mentioned, on a cylindrical body.

Figure 1 represents an axial section of the cylindrical body and the spiral tubes arranged thereon. Fig. 2 represents a side view of the said cylindrical body and spiral tubes and a longitudinal section of the vessel in which they are half immersed, and also represents in section a column of ascension and a vertical helix arranged therein. Fig. 3 represents a front end of the said cylindrical body and a transverse section of the said vessel.

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

A is the horizontal cylinder, mounted on a central shaft, B, and closed at its front end by a flat head and at its rear end by a conical head, D.

Upon the cylindrical surface A and the conical surface D are coiled four spiral tubes, *a b c d*, which are represented of rectangular transverse section; but may be of circular transverse section, if deemed preferable. These four spiral tubes debouch at the front end of the apparatus, as shown at *a' b' c' d'*, at the outer circumference of the cylinder A, and their rear portions, which are coiled upon the conical part D, terminate in a central cylindrical conduit, E, supported by a journal-box, K. This conduit enters a stuffing-box, F,

fitted to the lower horizontal portion of a stationary outlet-pipe, G, which rises to the height desired for the discharge of the liquid.

The apparatus thus constructed is set up in a tank, H, in which is collected the liquid to be elevated, and in which the cylinder is immersed to about half its diameter. To the front end of this tank is secured a journal-box for the central shaft, B, of the cylinder, and in the front part of the said tank is erected a standard, J, for the support of the journal-box K. The shaft B is furnished with a spur-wheel, L, actuated by a pinion, M, on a short shaft, S, which works in a journal-box in a bracket, I, attached to the tank, and another journal-box secured within the tank, and to which rotary motion may be given either through a crank, N, or through a pulley, P. Rotary motion being so given to the cylinder and spiral tubes, the liquid and the air enter at each revolution in substantially equal volumes into the tubes *a b c d* by the mouths *a' b' c' d'* thereof, and pass out together into the ascensional outlet-pipe G, whence the air escapes freely while the water overflows into the upper tank, O.

I have represented in the interior of the ascensional column formed by the outlet-pipe G a vertical helix, by the rotary motion of which, obtained from any suitable motor, the liquid in the said tube may be further elevated. The movement of this screw may be in part derived from the pressure of the air ascending in the tube.

The continuation of the spirals of the tubes *a b c d* on the conical rear end, D, of the cylinder A, may be omitted, and instead thereof each tube may be continued from the cylinder along the cone in a straight form as generatrices to the cone, as indicated by dotted lines in Fig. 2.

It will be understood that my apparatus operates without the employment of any valve, piston, or other mechanical organ, the raising of the liquid being only produced by the effect of the compression of the air in the apparatus, which is effected solely by the rotation of the apparatus.

The apparatus may be placed above the level of the liquid to be raised and operate by suction, in which case the conduit G would be turned downward, and would be the suction-pipe, and the liquid would be discharged by the openings *a' b' c' d'*, hereinabove described as serving for its entrance.

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

The combination of the rotary body A D, partly cylindrical and partly conical, the tubes *a b c d*, coiled on both the cylindrical and conical portions of said body, the central conduit, E, attached to said body and to which the said tubes converge, the stationary outlet-pipe G, and the stuffing-box connection F between said central conduit and said outlet-pipe, substantially as herein described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HECTOR THIÉRY.

Witnesses:
EUG. DUBOIS,
C. CRÉMERS.