A. MICÓ Y MUÑOZ.

GAS PUMP TO LIFT WATER.

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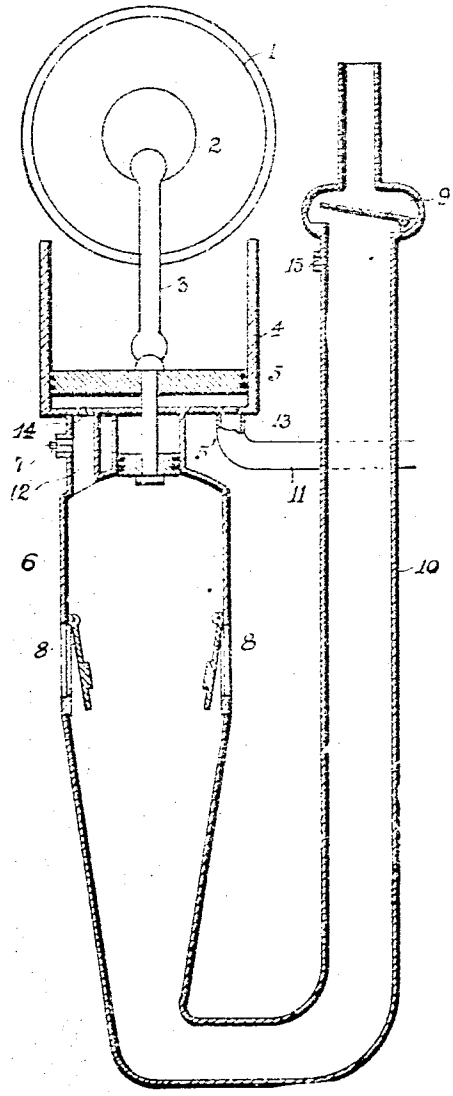

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UNITED STATES PATENT OFFICE.

ANTONIO MICÓ Y MUÑOZ, OF NEW YORK, N. Y.

GAS-PUMP TO LIFT WATER.

963,167. Specification of Letters Patent. Patented July 5, 1910.

Application filed April 17, 1909. Serial No. 490,651.

To all whom it may concern:

Be it known that I, ANTONIO MICÓ Y MUÑOZ, a subject of the King of Spain, and residing at New York, N. Y., United States of America, have invented a new and useful Improvement in Gas-Pumps to Lift Water, of which the following is a specification.

This invention relates to pumps, wherein a liquid is conveyed to a certain height or distance by means of an explosive gas, which is intermittently ignited.

An object of the invention is to provide a pump, which is adapted to operate continuously, and wherein an explosive gas or a mixture of gases is used for reciprocating the piston.

Another object of the invention is to provide a pump, wherein the piston is adapted to reciprocate continuously.

Another object of the inevntion is to provide a pump, wherein the explosion of gas or mixture of gases acts directly upon the body of water, contained in the pump.

Other objects will be more fully understood and conceived by reference to the following specification, the drawing, and the appended claims.

The body of the pump 6 is in the accompanying drawing provided with a plurality of inlet valves 8, and from one end of said body, a tubing 10 is extended, the free end of said tubing being provided with an outlet valve 9. A piping of smaller diameter may be connected with said tubing and may serve for conveying the liquid to any desired place. A cylinder 4 is connected with the body of the pump and adapted to communicate with the interior of the pump by means of a passage 12 and a valve 14. A piston 5, slidably mounted in the cylinder 4 is connected to crank-disk 2 by means of a connecting rod 3, said crank disk being rigidly connected to the fly wheel 1. The connection between the piston and the fly wheel are very well known in themselves and do not form the subject-matter of this invention. The piston rod extends through the bottom wall of said cylinder 4 and at its free end it is provided with a piston 5'. By this means the piston 5' is operatively connected with piston 5 and it is slidably guided in a cylindrical extension of the body of the pump 6 and in free communication with the same. A piping 11 is attached to the bottom of the cylinder 4, and an interposed valve 13 preferably operatable in opposite direction to the aforementioned valve 14 is adapted to interrupt the communication between said piping 11 and said cylinder 4. A spark plug 7 is preferably inserted in the passage 12; this specific form of the igniting device is well-known to any expert in the art and does not form a subject-matter of this invention.

The operation of the pump is about the following:— In ascending, the piston 4 draws illuminating gas or some other explosive gas from piping 11 through valve 13 into the cylinder 4. By reference to the drawing, it may be seen that in this motion the valve 14 is drawn into its closing position, so that air or gas in the body of the pump 6 may not escape therefrom. Simultaneously, water or any other liquid, which is to be conveyed by the pump is drawn into the body of the pump through the valve 8, while the outlet valve 9 is forced down on its seat by suction. In the return motion of the piston, gas is forced through the passage 12 from the cylinder 4 into the pump 6 and the mixture in said pump may then be at a certain moment ignited by means of the spark plug 7. The exploded mixture will increase suddenly its volume and force the liquid from the pump, closing the valve 8, into the pipe 10 and through the valve 9. By means of the fly wheel 1, a safe and continuous operation of the piston 5 is obtained. A small amount of the mixture of gas and water may escape through the aperture 15. This mixture may be advisably returned to the cylinder 4, to cool the same in a way, which is known to any expert in the art.

I claim:—

1. In a pump the combination of a cylinder, a piston slidable therein, a pump body partly filled with liquid, a valved passage between said cylinder and said body, said piston being adapted to force an explosive mixture into said body above the level of the liquid and into contact therewith while moving in one direction, a second piston within said body and in conction with said first named piston for compressing the explosive charge within said body and means for igniting said charge, said second named piston being adapted to activate the return stroke of said first named piston under the influence of the compressed and exploded charge.

2. In a pump the combination of a cyl-

inder, a piston slidable therein, a pump body partly filled with liquid, a valved passage between said cylinder and said body, a second cylinder in alinement with said first named cylinder, a piston slidable therein connected with said first named piston, said second cylinder being in communication with said pump body, said first named piston being adapted to force an explosive mixture into said body above the level of the liquid and into contact therewith while moving in one direction, said second piston being adapted to compress the axplosive charge therein and means for igniting said charge, said second named piston being adapted to actuate the return stroke of said first named piston.

3. In a pump the combination of a cylinder, a piston slidable therein, a pump body partly filled with liquid, a valved passage between said cylinder and said body, a second cylinder in alinement with said first named cylinder, projecting into said body and opening thereinto, a piston slidable in said second cylinder and rigidly connected with said first named piston, said first named piston being adapted to force an explosive mixture into said body above the level of the liquid and into contact therewith, said second piston being adapted to compress the explosive charge therein and means for igniting said explosive charge, said second named piston being adapted to actuate the return stroke of said first named piston.

4. In a pump the combination of a cylinder, a piston slidable therein, a fly-wheel in operative connection with said piston, a pump body communicating with the liquid to be pumped, a passage between said cylinder and said body, a second cylinder in alinement with said first named cylinder projecting into said body and opening thereinto, a piston connected to said first named piston and slidable in said second cylinder, said pistons being adapted in their stroke in one direction to force an explosive mixture into said body and to compress the same therein and in their stroke in opposite direction to draw an explosive mixture into said cylinder and liquid into said body respectively, and means for igniting the explosive charge in said body.

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

ANTONIO MICÓ Y MUÑOZ.

Witnesses:

MADDEN SUMMERS,

JOSE MA. GAY.