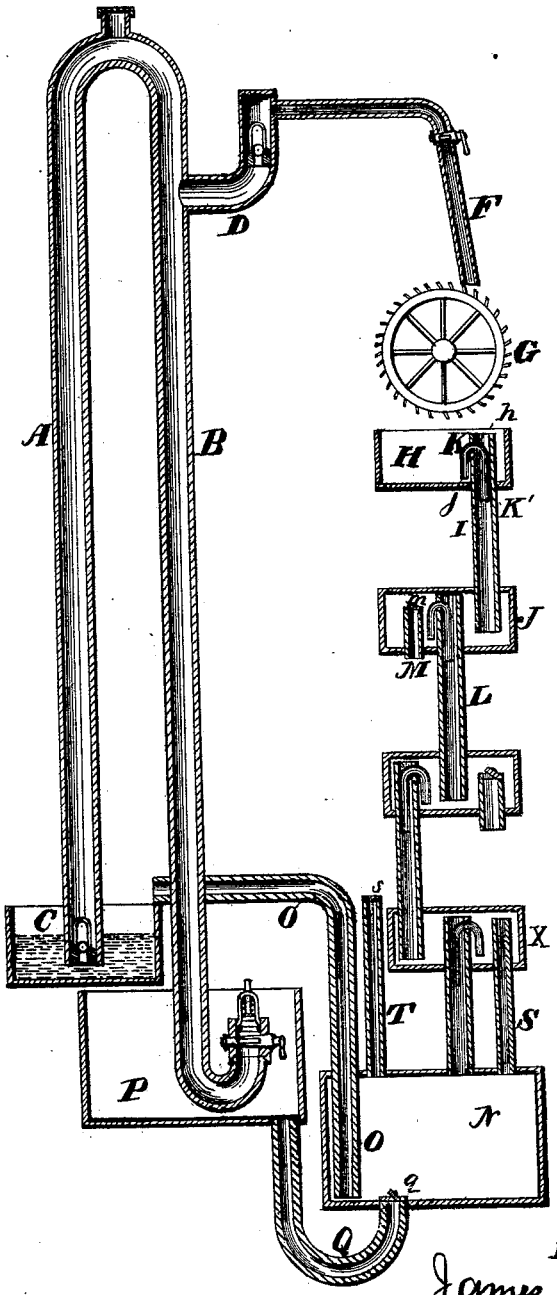
J. M. BOIS.

HYDRAULIC MOTOR.

No. 186,195. Patented Jan. 16, 1877.



WITNESSES.

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JAMES M. BOIS, OF SALAMANCA, NEW YORK.

IMPROVEMENT IN HYDRAULIC MOTORS.

Specification forming part of Letters Patent No. **186,195**, dated January 16, 1877; application filed June 17, 1876.

To all whom it may concern:

Be it known that I, JAMES M. BOIS, of Salamanca, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Hydraulic Motors; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in siphon-pump hydraulic motors.

The accompanying drawing represents a vertical section of the several parts of the pump.

My invention consists in the combination, with a siphon, of an overshot or a turbine water-wheel, and one or more air-tight tanks or receptacles connecting with the short leg of the siphon, whereby a portion of the water raised serves to operate the water-wheel, and the water, in its downward descent, expels the contained air from the air-tight receptacles, and forces the water from the lowest tank or receptacle into the vessel beneath the short leg of the siphon.

A and B are the respective short and long legs of the siphon. Water is furnished to the short leg A by means of the open-top vessel or tank C, which is supplied with water from a running stream or any available source. A pipe, D, is attached to the long leg B at any desired point, but preferably near the top of same, and said pipe connects with a pipe, F, which extends any desired distance to carry a sufficient amount of water to operate a water-wheel, G. Immediately beneath the water-wheel G is placed a vessel, H, which vessel receives the water as it leaves the wheel. A pipe, I, projects through the bottom of vessel H, and enters nearly to the bottom of the air-tight receptacle J. The pipe I is of nearly the same height as the vessel H, and has an open top, *h*. Within vessel H is placed a small siphon, K, the short leg *j* of which nearly approaches the bottom K, while the long leg K′ is inserted in the stand-pipe I, to allow a current or circulation of air downwardly past the siphon before the water commences to flow through the same. The air-tight receptacle I is also provided with a stand-pipe, L, reaching nearly to the top of the vessel, and within said pipe is inserted the long leg of a siphon, in the manner heretofore described. Within receptacle J there is also secured an independent pipe, M, extending nearly to the top of the receptacle, and said pipe is provided with a downwardly-closing flap or other valve, *m*. Any number of air-tight receptacles, constructed as above set forth, may be employed. The lower or main reservoir N is provided with an air-circulating pipe, extending from the top plate of same to the upper part of the vessel located immediately above the reservoir N. A pipe, O, extends from near the bottom of reservoir N to the vessel or tank C, located beneath the short leg of the siphon. Immediately below the long leg of the siphon is placed a vessel, P, which vessel connects with reservoir N by means of a pipe, Q, which pipe has a downwardly-closing valve, *q*, allowing the water to flow freely from vessel P into the reservoir N, when pressure is not applied in the latter; but when pressure is applied in reservoir N it operates to close the valve *q*, thereby preventing the contained water in reservoir from flowing back into vessel or tank P, and forcing the same through the pipe O into the vessel C.

The operation of the apparatus is as follows: Air having been expelled from the larger siphon, the water contained in vessel C is raised by atmospheric pressure, and establishes a continuous flow of water through the siphon, the greater portion of the stream escaping from the longer leg of the same. A portion of the current is allowed to escape through the pipe D, and is carried through pipe F to a water-wheel, which is actuated thereby. The water-wheel may be located at any desired point, and serves to drive any mechanism connected therewith. The water, falling from the water-wheel, enters the open-top vessel H, rising in the same until it has reached the top or bend in the small siphon K, when the water flows through the siphon, and is delivered into the air-tight vessel J. As the water enters the receptacle it displaces the air therein contained until the water reaches

the top of the siphon in said receptacle, when the valve *m*, attached to the top of an air-pipe, M, is forced open by atmospheric pressure, and serves to establish an equilibrium of pressure, and allow the water to flow in the next lower receptacle. This operation is carried on in each air-tight receptacle, the water in one displacing and forcing an equal amount of air into the next lower receptacle. As the water leaves the receptacle connecting with the reservoir N the air displaced is constantly replaced by an equal volume of air flowing from the reservoir N through the open-ended pipe S. When the reservoir X is filling with water the air is displaced therefrom, and serves to force an equal amount of water from reservoir N into the vessel C through pipe O, from which the water is again forced upwardly through the siphon. When the reservoir X is filled the water will flow freely through the siphon and enter reservoir N, and the air in the latter vessel will flow back into reservoir X. An air-pipe, T, is attached to the top of reservoir N, and the upper end of said pipe T is preferably about on a line with the bend in pipe O. An upwardly-closing valve, *s*, is attached to pipe T. Hence, when pressure is applied to reservoir N air cannot escape through the pipe T. This pipe serves to admit air to the reservoir N when there is only a slight pressure therein, and thus allows the valve *q* to open, and water to enter from the vessel connected to the long leg of the siphon.

I do not claim that the water passing through the siphon can all be continuously used to drive the water-wheel, as there must needs be a fountain-head, from which the water is raised by means of the siphon, and a certain percentage only of this amount is utilized for the purpose set forth.

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

1. The combination, with a siphon and an exit-pipe attached to the long leg of the same, of a water-wheel and one or more air-tight receptacles, constructed substantially as set forth, to receive the water from the water-wheel and force the same back to the short leg of the siphon, substantially as and for the purpose set forth.

2. The combination, with the siphon A B and pipes D F, of the water-wheel G and lower vessels H, air-tight receptacles J, reservoir N, with connecting-pipes, all constructed and arranged substantially as and for the purpose specified.

3. The combination, with the vessel H and air-tight receptacle J, of the pipe I and small siphon K, substantially as and for the purpose specified.

4. The combination, with the air-tight receptacles, siphons, and connecting-pipes, of the reservoir N, pipe O, and vessel C, substantially as and for the purpose specified.

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

JAMES M. BOIS.

Witnesses:

WM. L. BRAMHALL,

F. O. MCCLEARY.