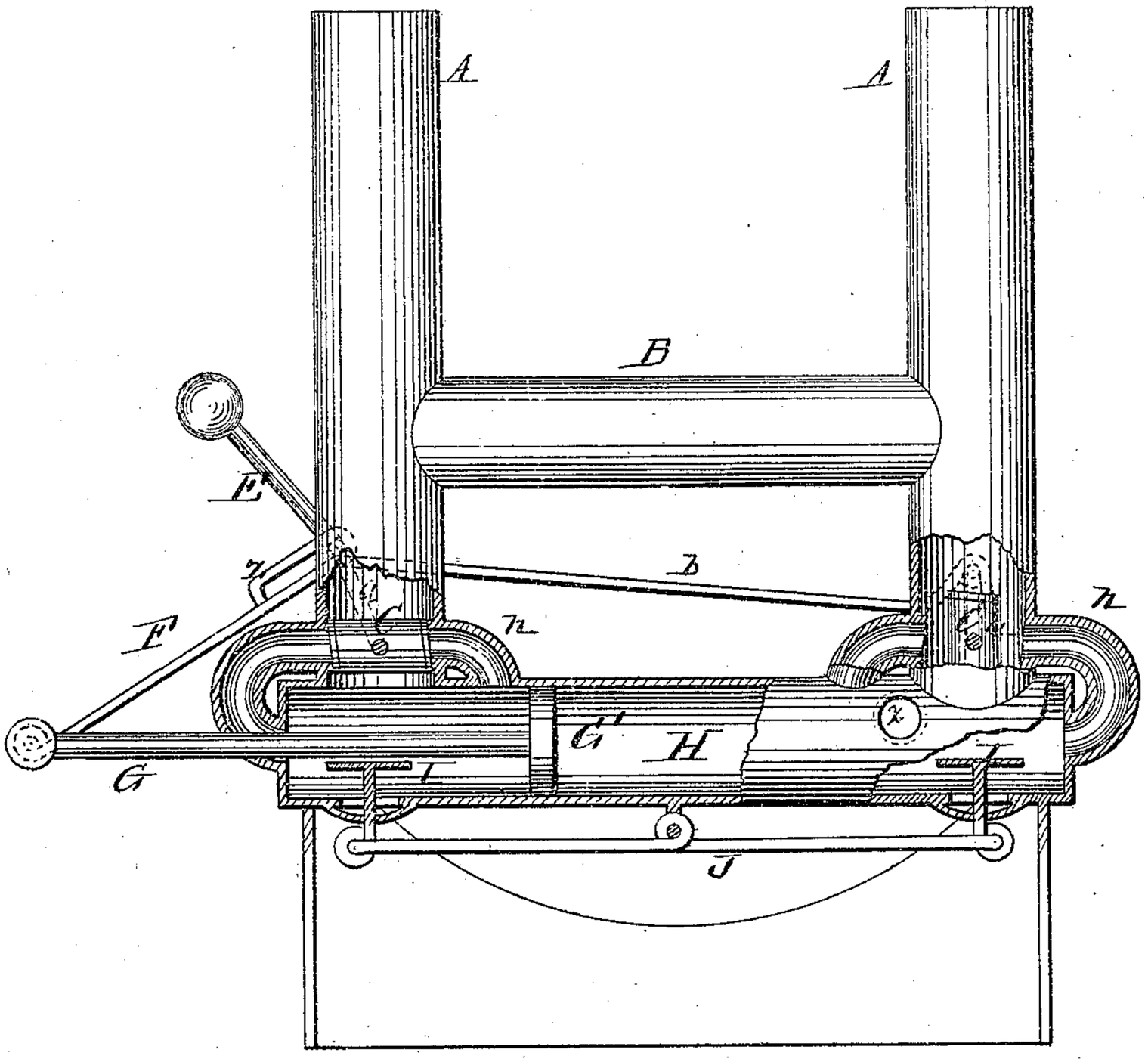
R. F. DOBSON.

Hydraulic-Engines.

No. 134,651. Patented Jan. 7, 1873.



Witnesses.
E. A. Bates.
George E. Upham.

Inventor:
Robert F. Dobson,
Chipman & Osmun & Co.,
Attys.

UNITED STATES PATENT OFFICE.

ROBERT F. DOBSON, OF BELMONT, WISCONSIN, ASSIGNOR OF ONE-THIRD HIS RIGHT TO GEORGE FROST, OF SAME PLACE.

IMPROVEMENT IN HYDRAULIC ENGINES.

Specification forming part of Letters Patent No. **134,651**, dated January 7, 1873.

To all whom it may concern:

Be it known that I, ROBERT F. DOBSON, of Belmont, in the county of La Fayette and State of Wisconsin, have invented a new and valuable Improvement in Hydraulic Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

The figure of the drawing is a representation of a side view of my invention, partially sectional.

This invention has relation to hydraulic engines; and it consists in the construction and novel arrangement of water-pipes, valves, and connecting-rods, whereby the momentum of all the water in the engine is utilized as a motive power before being allowed to escape, all substantially as hereinafter described.

In the accompanying drawing, A A represent vertical pipes designed to hold water. B represents a horizontal pipe connecting the pipes A A near their lower ends and above the valves hereinafter described. C C represent balanced pivoted valves in the pipes A, having parallel beveled ends, and connected by means of the cranks *a* and rod *b* in such a manner that when one valve is closed the other will be open, and vice versa. E designates a lever attached to one of the cranks *a*, and used for the purpose of holding the valves firmly in position, a weight being attached to the end of said lever. A lever may, for the same purpose, be attached to each crank. F designates a rod connecting the valve-cranks *a* to a piston-rod, G, or to a balance-wheel connected to said piston. This rod has a long slot, *z*, in its upper end, in which works the crank to which it is directly attached. The piston-rod holds a piston, G′, which works through a horizontal cylinder, H, communicating, by means of bent tubes *h*, with the vertical pipes A. I I designate disk-valves opening upward and into the cylinder H, and connected by means of a balanced rod, J, pivoted to the under side of the cylinder H.

This apparatus operates as follows: The pipes A being full of water and the valves C closed, to prevent the water from passing down through the tubes *h* to the cylinder H the rod F is uncoupled from one of the valve-cranks and the valve opened. The rod is then replaced. The water now passes the open valve, enters the cylinder H through the tubes *h*, expelling the air therefrom, and closing one of the valves I I and one of those marked *x* which open into the cylinder from the side. The water then comes in contact with the piston with a force and momentum in proportion to the height of the water in the pipes A. The piston is thus moved toward the opposite end of the cylinder, and the rod F caused to operate the valves C, closing the open valve and opening the one closed as soon as the end of the slot *z* reaches the crank to which it is attached, the operation occurring when the piston has traveled the full length of its stroke. The water will now descend through the open valve as in the first instance, expelling the air, reversing the piston, and closing the adjacent valves I *x*, at the same time opening the valve I at the other end of the cylinder and allowing the first supply of water to escape. As soon as the piston travels the length of its reverse stroke the other end of the slot *z* comes in contact with the valve-crank, closing the valve attached, and opening the closed valve, thus allowing the operation already described to take place again.

The connecting-pipe B is intended to equalize the quantity of water in the pipes A A, and is also used so that, when the engine is at work and the motion of the water stopped in its course through the valve below, the reaction thereby caused may be communicated from the pipe A in which it takes place to the other pipe, and be thus utilized as a part of the force by the latter pipe when its side of the engine is at work.

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

1. The horizontal connecting-pipe B, in combination with the vertical pipes A of a hydraulic engine, substantially as set forth.

2. The vertical water-pipes A, horizontal cylinder H, valves C, connecting-rod *b*, piston G′, and slotted connecting-rod F combined, substantially as specified.

3. The bent tubes *h*, in combination with the pivoted valves C, vertical tubes A, and piston-cylinder H, substantially as specified.

4. The valves I I and balanced or pivoted connecting-rod J, in combination with the cylinder H and piston G, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ROBERT F. DOBSON.

Witnesses:

JEHU PRITCHARD,

JOHN COMMINS, Jr.