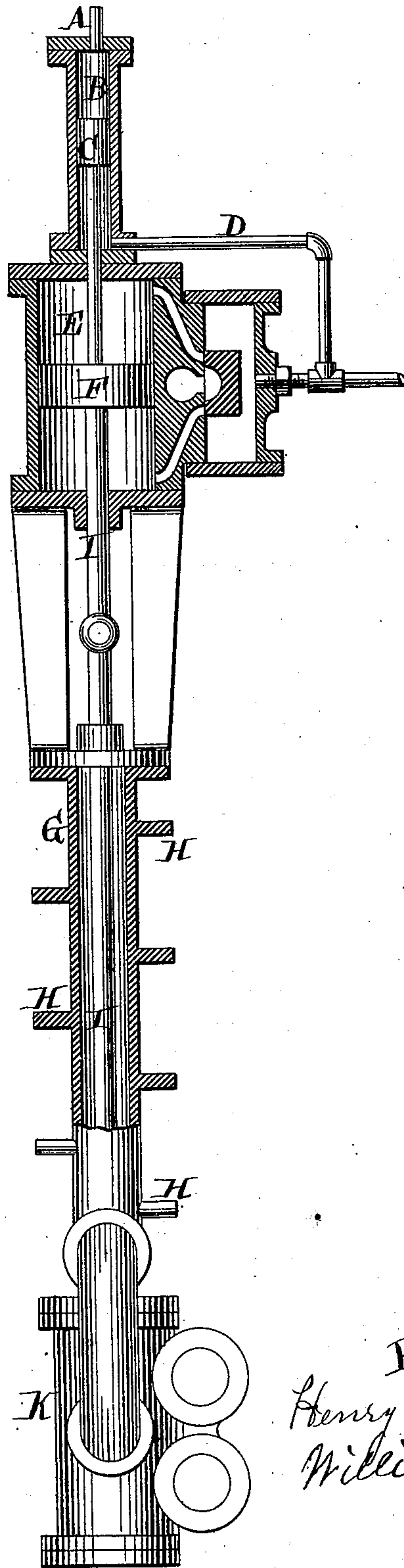


H. A. JAMIESON & W. FOSTER.
Vertical Steam-Pump.

No. 206,457.

Patented July 30, 1878.



Witnesses.
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UNITED STATES PATENT OFFICE.

HENRY A. JAMIESON AND WILLIAM FOSTER, OF BROOKLYN, NEW YORK,
SAID JAMIESON ASSIGNOR TO SAID FOSTER.

IMPROVEMENT IN VERTICAL STEAM-PUMPS.

Specification forming part of Letters Patent No. **206,457**, dated July 30, 1878; application filed
December 20, 1877.

To all whom it may concern:

Be it known that we, HENRY A. JAMIESON and WILLIAM FOSTER, of the city of Brooklyn, county of Kings, and State of New York, are joint inventors of an Improvement in Vertical Steam-Pumps, of which the following, taken in connection with the accompanying drawing, is a full, clear, and exact description.

Our invention more particularly applies to deep well and mine pumps, where the steam-cylinder of the pump is located at the surface or top of the well or shaft, and the water-cylinder of the pump placed within a suitable distance of the water—in some cases two or three hundred feet below the surface of the earth.

Pumps constructed in this way have advantages over the ordinary steam-pump. As the steam-cylinder of the pump is at the surface the pump can be started at any time by letting on the steam, although the water-cylinder be submerged in water.

In the use of the pumps above described, however, difficulties and inconveniences have been experienced which our invention fully overcomes. The said pumps have been found to work with very unsteady motion, the weight of the piston and piston-rods causing the downward stroke to be too rapid and the upward stroke to be retarded to the same extent. To remedy this defect is one of the objects of our invention.

In case the steam and water cylinders are placed on separate bases or foundations, the jar or shaking of the pump is sure to change the relative positions of the said cylinders, which causes friction, and also causes the pistons to strike the cylinder-heads. To obviate this imperfection is the other object of our invention.

The drawing represents a sectional view of our improvement.

Above the main steam-cylinder E is attached the small steam-cylinder or balancing-cylinder B, which is made with an area equivalent to the weight of the piston and piston-rod it

is to balance. In this cylinder B is the balancing-piston C, which plays in the cylinder B, and is connected with the main piston-rod I. The steam-pipe D connects the balancing-cylinder B with the main steam-pipe of cylinder E. F is the main steam-piston, which plays in cylinder E. The pipe G connects the main steam-cylinder E with the water-cylinder K. The pipe G also answers as the delivery-pipe or discharge for the water from and through the water-cylinder K. Secured or cast on the pipe G are the rungs or steps H, which serve as a ladder to descend into the well or shaft.

The operation of our improvement is as follows: The steam from the steam-pipe or steam-chest passes through the pipe D, which connects with the balancing-cylinder B below the piston C, at the bottom of balancing-cylinder B, the upper end of which is left open to the atmosphere. The pump, when the piston F and piston-rod I are making their downward stroke, is thus balanced by the steam passing through the pipe D and pressing on the under side of the piston C in balancing-cylinder B. On the upward stroke of the piston F and piston-rod I the steam which passes through the pipe D from the steam-pipe or steam-chest exerts a force equal to the weight of the piston F and piston-rod I, and thus prevents their motion from being too slow.

The motion of the piston F and piston-rod I in their upward and downward stroke is thus made uniform, and all unsteadiness in the action of the pump avoided.

The auxiliary or balancing cylinder B may be placed below the main cylinder E instead of above, as shown in the drawing.

The pipe G is made in suitable lengths, which are secured together, and thus firmly connects the steam-cylinder E with the water-cylinder K, thus preventing the cylinders from changing their relative positions, while at the same time it acts as a delivery or discharge pipe for the water from the water-cylinder K, and as a ladder by which to descend into the well or mine.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

In connection with a vertical steam-pump, a balancing-cylinder and piston, with the necessary steam and air pipes for balancing and equalizing the stroke of pump, substantially as described, and for the uses and purposes above set forth.

In testimony whereof we have hereunto set our hands this 18th day of December, 1877.

HENRY A. JAMIESON.
WILLIAM FOSTER.

In presence of—

CHARLES G. COE,
LOUIS W. FROST.