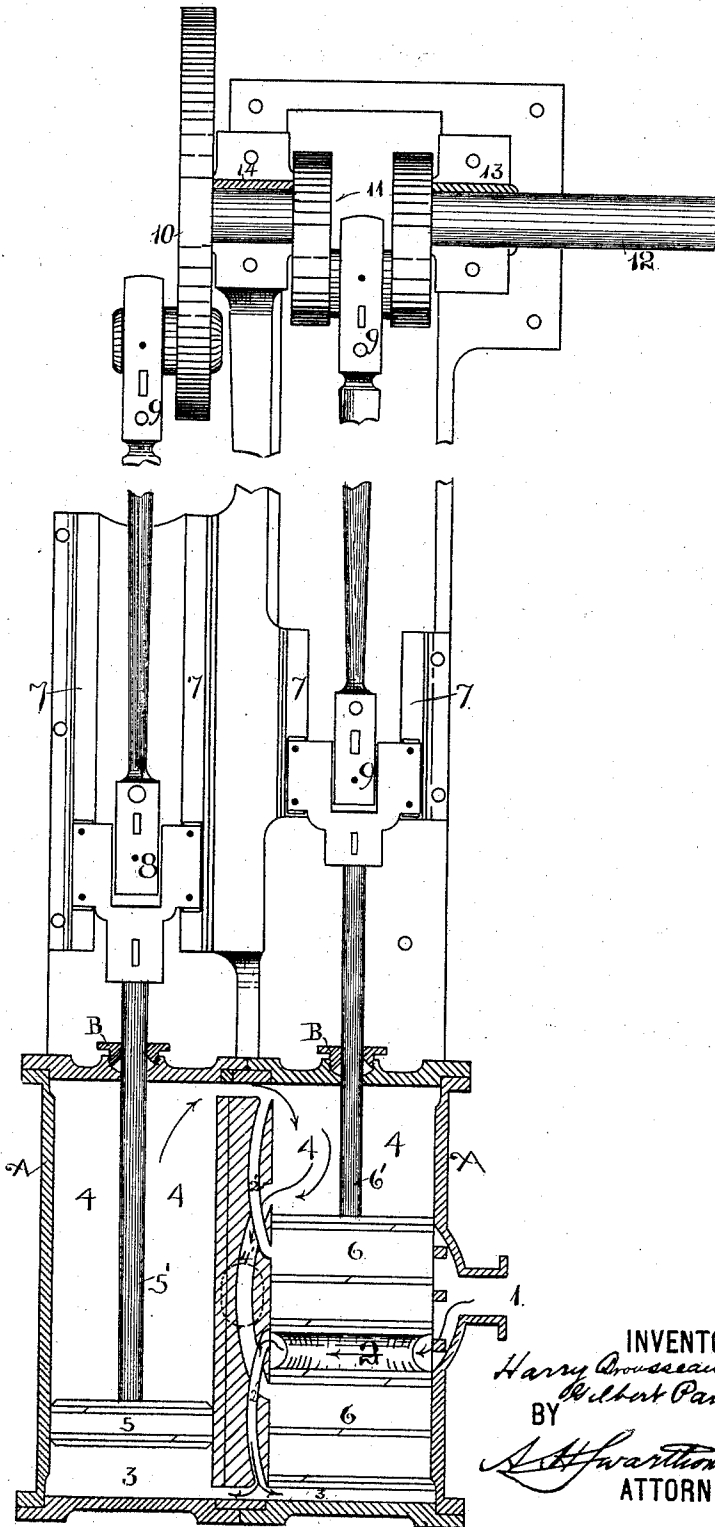


(No Model.)

H. BROUSSEAU & G. PATTERSON.
VALVELESS ENGINE.

No. 477,041.

Patented June 14, 1892.



WITNESSES:

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HARRY BROUSSEAU AND GILBERT PATTERSON, OF NEWBERRY, MICHIGAN.

VALVELESS ENGINE.

SPECIFICATION forming part of Letters Patent No. 477,041, dated June 14, 1892.

Application filed October 17, 1891. Serial No. 409,038. (No model.)

To all whom it may concern:

Be it known that we, HARRY BROUSSEAU and GILBERT PATTERSON, citizens of the United States, residing at Newberry, in the county of Luce and State of Michigan, have invented certain new and useful Improvements in Valveless Engines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters and figures of reference marked thereon, which forms a part of this specification.

Our invention is a valveless engine and is constructed as follows:

The figure is a top horizontal sectional view of the complete engine, shown standing on its back center.

A is the frame of the cylinder, having the openings B B for the piston-rods 5' and 6' and constructed in the usual manner. Steam is admitted through the opening 1 at the side. 5 and 6 are the pistons, and 5' and 6' are the piston-rods, which are pivoted to the connecting-rods 8 and 9, respectively. 7 7 are the guide-bars. The piston-rod 6' is much shorter than the rod 5', and its piston 6 occupies two-thirds of the length of the cylinder. Consequently its stroke is shorter. The piston 6 is much smaller at its center 2, so as to permit the live steam a free passage to the ports, forming a valve for itself and piston 5. The live steam is admitted through 1, passing through 2, and when the engine is on its back center into the cylinder 3 3, driving the pistons 5 and 6 forward, the exhaust-steam passing through the exhaust-port 4', and vice versa.

12 is the driving-shaft, journaled in the bearings 13 and 14 and having two cranks 10 and 11 close together, the crank 11 being much shorter, to which are secured the connecting-rods 8 and 9, respectively. In the revolution the main crank 10 leads the valve-crank 11.

The engine resembles the ordinary double engine, only one crank is much shorter—viz., 11, which engages the valve-piston 6. The valve-piston 6 is cast in one piece and turned to fit in the cylinder and is packed with spring-packing. The piston 5 is built as an ordinary piston. The cylinder is built in two parts and bolted in together. We do not wish to confine ourselves to any special frame, as the engine may be built vertical or horizontal.

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

A valveless engine consisting of a cylinder having two cylinders connected at each end, provided with a live-steam port on its side and midway its length and each cylinder containing a piston, one an ordinary piston, the other, the piston next the live-steam port, occupying about two-thirds of the length of the cylinder and having its center smaller transversely opposite the live-steam port and having within the partition dividing the cylinder two live-steam passages 2' 2', opening into each end of the cylinders, and the exhaust-ports 4' in each end of the cylinder, whereby when steam is admitted it will be conveyed through the small piston to the live-steam passage 2' to end of cylinder, forcing pistons backward or forward, as the case may be, said pistons connected to individual cranks, the piston-rod for the valve-piston being shorter than the other, the valve-piston traveling about one-third the distance of the other, substantially as described, and as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

HARRY BROUSSEAU.
GILBERT PATTERSON.

Witnesses:

L. N. FORBES,
JOSEPH STAFFORD.