

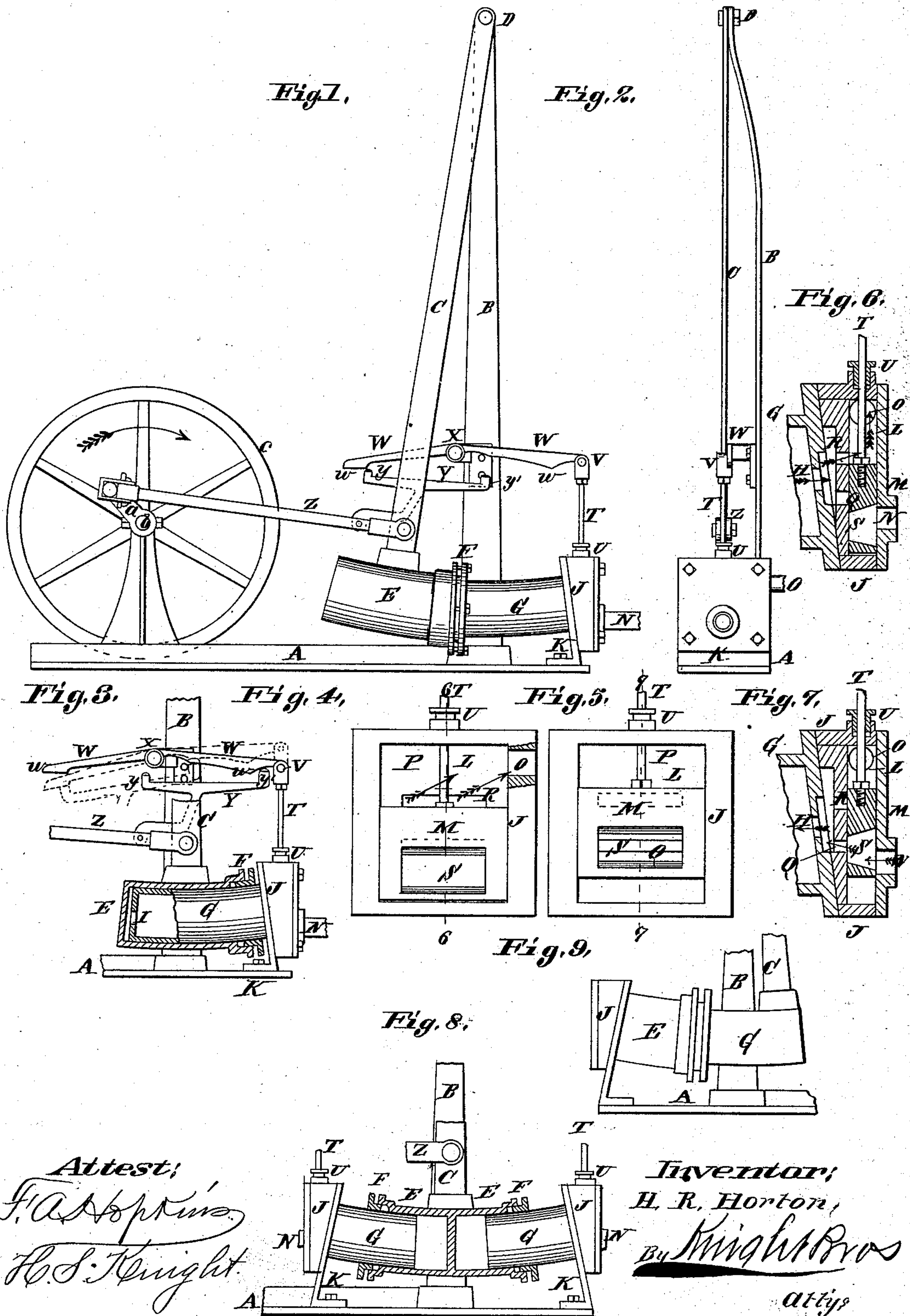
(No Model.)

H. R. HORTON.

MOTOR.

No. 326,117.

Patented Sept. 15, 1885.



UNITED STATES PATENT OFFICE.

HILON R. HORTON, OF ST. LOUIS, MISSOURI.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 326,117, dated September 15, 1885.

Application filed July 10, 1885. (No model.)

To all whom it may concern:

Be it known that I, HILON R. HORTON, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Motor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This is a motor having a box or cylinder hung upon an oscillating arm and working upon a fixed plunger, through which steam or other fluid under pressure enters the box or cylinder.

I shall describe the motor or engine as if steam were the medium used; but compressed air or any other fluid under pressure may be used, or gas may be formed, or gas or gases expanded by explosion, and the motor actuated by any of these means, my invention applying to the device by which fluid of any kind, having a pressure greater than the usual pressure of the atmosphere, may be rendered available to give motion to machinery.

Figure 1 is a side elevation of the engine or motor, showing the cylinder near its outer position. Fig. 2 is an end elevation of same. Fig. 3 is a detail, partly in vertical longitudinal section, showing the cylinder in its inner position. Fig. 4 is an enlarged end elevation of the valve-box and valve, with the cap of same removed and the valve in position for exhaust. Fig. 5 is a similar view except that the valve is in the position to admit steam or other fluid into the cylinder. Fig. 6 is a vertical longitudinal section at 6 6, Fig. 4. Fig. 7 is a vertical longitudinal section at 7 7, Fig. 5. Fig. 8 shows a modification in which the cylinder is double-ended and works on two plungers. Fig. 9 illustrates a modification.

A is the bed-frame, having an upright or post, B, from which a hanger-rod, C, is suspended in the manner of a pendulum, the rod oscillating freely on a pin, D.

To the lower end of the rod C is secured the cylinder E, which is shown round in transverse section, but which may be made of any desired sectional form. The cylinder is curved in the direction of its length, being of segmental form concentric with the point of oscillation D. (See Figs. 1, 3, and 8.)

F is a stuffing-box of substantially ordinary construction, by which the cylinder is made to work with a steam-tight joint upon the plunger G. The plunger is made of substantially the same form as the cylinder, and of such size that the cylinder works over it. The plunger is hollow, and has through its ends holes H and I for the passage of steam (or other fluid) to and from the cylinder.

The plunger and the valve-chest J are firmly secured to the base-frame A by bracket K, or other suitable means.

The valve-chest has a chamber, L, in which the slide-valve M fits snugly, so as to be substantially balanced. N is the induction-port, and O the exhaust-port, of this chamber. The valve-chest has a vertical diaphragm, P, through which are the induction-port Q and the exhaust-port R, the former, Q, when the valve is in its upper position, being in line with the opening S through the valve, and the latter, R, being closed by the valve. (See Fig. 7.) On the other hand, when the valve is in its lower position, as seen in Fig. 6, the port Q is closed, and the exhaust-port R in communication with the upper part of the chamber L and the exhaust-port O. The hole H of the plunger end is in constant communication with both holes or ports Q and R.

T is the valve-stem, passing through a stuffing-box, U, in the top of the valve-chest, and connected by a pin, V, to one end of the working bar or lever W, which bar oscillates on a pin, X, projecting from the upright B.

Y is a bar, having at the ends studs $y y'$, which, as the rod C oscillates, are brought in contact with the underside of the working-bar W, and cause the oscillation of the bar W and the vertical movements of the slide-valve.

$w w$ are projections against which the studs impinge as the cylinder is just commencing and is just reaching the end of its forward stroke. The bar Y is attached to the pitman Z, by which the rod C is connected to the crank a of the shaft b of balance-wheel c , and thus the bar Y has a compound motion, the oscillation of the pitman causing its ends to rise and fall as the crank revolves.

Suppose the parts to be in the position

shown in Fig. 1, in which the exhaust is taking place and the cylinder has commenced its retrograde movement, being impelled by the momentum of the balance-wheel, when the cylinder has reached its inner position, as seen in Fig. 3, and in commencing its forward movement the stud Y" comes in contact with the projection *w* and reverses the valve, then the exhaust is closed and the induction opened, and the cylinder is forcibly driven forward.

In the modification shown in Fig. 9, the cylinder is fixed and the plunger secured to the frame B.

In Fig. 8 is shown a modification in which the cylinder is double-ended and works on two plungers, the movement being thus made positive in both directions.

The valves may be worked in the manner described.

I claim—

1. A cylinder supported on an oscillatory rod or frame, and working over a fixed plunger, substantially as set forth.

2. The combination of an oscillating hanger-rod, a cylinder supported on the same and curved concentrically with the axis of oscillation, and a fixed plunger on which the cylinder works, and which has a passage through it for the entrance and exit of fluid, for the purpose set forth.

3. The combination of fixed plunger having a passage extending through it, an oscillating cylinder working over it, and a slide-valve constructed to operate, substantially as described, and actuated by connection with the oscillating parts.

4. The combination of an oscillating hanger-rod, a cylinder attached to said rod and working over a fixed plunger having a passage through it, a slide-valve governing the current of fluid through said passage, and having a working bar or lever connected to the valve-stem, and actuated by bar or frame attached to a pitman which connects the hanger-rod to the crank of a balance-wheel.

5. The combination of the oscillating hanger-rod C, the pitman Z, with bar Y attached to it, and the working bar or lever W, having connection with the valve-stem T, substantially as and for the purpose set forth.

HILON R. HORTON.

In presence of—

GEO. H. KNIGHT,
SAML. KNIGHT.