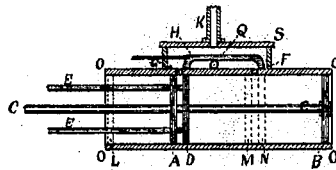
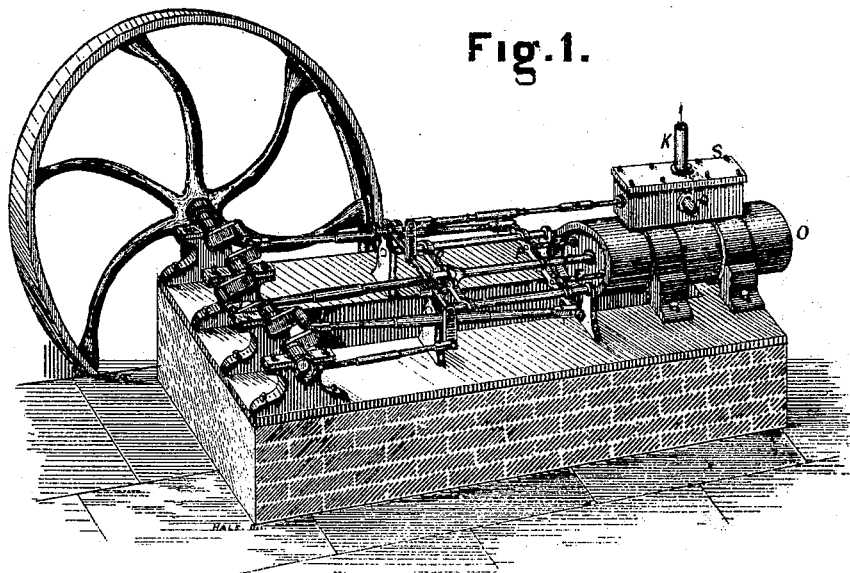


A. W. Morrell,

Reciprocating Engine.

No. 107,524.

Patented Sept. 20, 1870.



Witnesses:
Perley & Co. Jr.
Addison & Stone

Inventor(s)

Albert W. Morrell

UNITED STATES PATENT OFFICE.

ALBERT W. MORRELL, OF NILES, MICHIGAN, ASSIGNOR OF ONE-HALF HIS
RIGHT TO PERLEY HALE, JR.

IMPROVEMENT IN DOUBLE-PISTON ENGINES.

Specification forming part of Letters Patent No. **107,521**, dated September 20, 1870.

To all whom it may concern:

Be it known that I, ALBERT W. MORRELL, of Niles, in the county of Berrien and State of Michigan, have invented a Double-Acting Piston-Power for Engines or Pumps, of which the following is a specification.

My invention relates to the combination of three pistons in the same cylinder, and to the arrangement thereof for receiving or applying power in connection with other machinery. The combination is made in such a manner as to dispense with cylinder-heads, and can be simply changed from an engine to a pump by easily reversing the action of the valve. I use but one steam-chest in an engine constructed on these principles, and have the double action of steam or compressed air upon the pistons. To change an engine of this kind into a pump, change the position of the valve so that suction of the pump will be through the exhaust-pipe of the engine, and the flow of the element, whether water, air, &c., from the pump will be through the supply-orifice to the engine.

The object of the invention is to produce a double engine in one cylinder.

In the accompanying drawings, Figure 1 is a view of an engine embodying the principles of my invention. Fig. 2 is a sectional view of the cylinder, showing the arrangement of the pistons.

O O O O is the cylinder; A B D, the pistons; C E E, the piston-rods; F G, openings from the chest S into the cylinder; H, the valve; K, the supply-pipe to an engine; Q, the exhaust to an engine.

Operation: When the pistons A D B have the position represented in Fig. 2, steam passes from the chest S through the orifice G into the

chamber formed by the pistons A D, and the cylinder O O O O, forcing the piston A to the position represented by the dotted lines L, and the piston D to the position indicated by the dotted lines M. The pistons A and B are secured to the same rod, C. Consequently, when the piston A is forced to the position L, the piston B must follow to the position N. When the piston D has assumed the position indicated by M, and B that indicated by N, the valve H is drawn to the front end of the steam-chest, and steam is permitted to enter the chamber inclosed between M and N, through the orifice F, forcing N to B, M to D, and L to A. The piston-rod C passes freely through the cross-head P, Fig. 1, and is secured to the cross-head R, from which motion is communicated to the shaft of the fly-wheel by a connecting-rod and crank. The rod C, Fig. 2, works through a stuffing-box in the piston D. The piston D is attached to the rods E E, which pass through stuffing-boxes in the piston A, and are secured to the cross-head P, from which motion is communicated to the fly-wheel by connecting-rods and cranks. Thus, by the action of steam (or compressed air) between the pistons alternately, continuous motion is imparted to the fly-wheel, and a very effective engine obtained.

I claim—

The combination and arrangement of three pistons in one cylinder, substantially in the manner and for the purpose herein set forth.

ALBERT W. MORRELL.

Witnesses:

ADDISON E. STONE,
PERLEY HALE, JR.