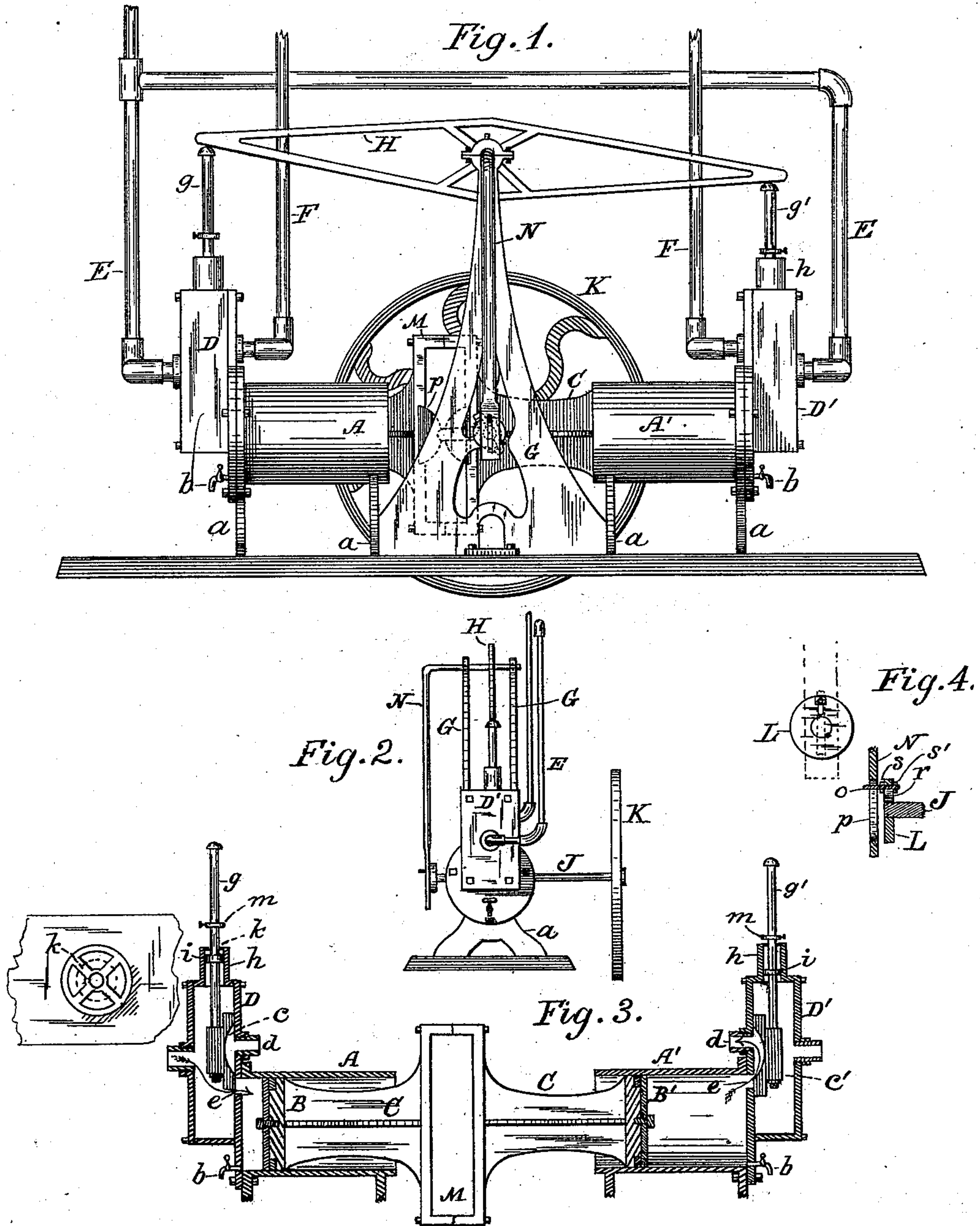


(No Model.)

M. P. ANDERSON.  
STEAM ENGINE.

No. 417,379.

Patented Dec. 17, 1889.



Witnesses :  
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# UNITED STATES PATENT OFFICE.

MORRIS P. ANDERSON, OF PEORIA, ILLINOIS.

## STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 417,379, dated December 17, 1889.

Application filed May 19, 1888. Serial No. 274,356. (No model.)

*To all whom it may concern:*

Be it known that I, MORRIS P. ANDERSON, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Steam-Engines; and I do hereby 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.

This invention relates to steam-engines; and it consists in certain improvements in the construction of the same, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a steam-engine provided with my improvements. Fig. 2 is an end view of the same. Fig. 3 is a sectional view of the steam-cylinders, pistons, steam-chests, and other details. Fig. 4 illustrates the eccentric or crank-wheel and its connections.

In the drawings, A and A' designate two steam-cylinders, the same being arranged in positions opposite to each other on the same horizontal line. These cylinders are provided with supports *a*, and are open at their inner ends, as shown. The cocks *b* are intended for the discharge of water accumulating in the cylinders from condensation.

B and B' indicate the pistons in the steam-cylinders, said pistons being carried by the arms C, which form piston-rods and extend in opposite directions from a vertical rectangular frame M.

D and D' indicate the steam-chests, each of which is secured in a vertical position to the outer end of one of the steam-cylinders and communicates with the cylinder by a port *e* in the head of the cylinder, as shown. The slide-valves *c c'* are placed in vertical positions in the steam-chests D D', respectively, and move up and down therein over the ports *e* and exhaust-ports *d* of pipes F. Each of the valve-stems *g* and *g'* extends upward through a cylinder *h*, extending from the top of the steam-chest, the valve-stem being provided with a head *i*, which fits and moves in said cylinder *h*. The cylinders *h* are open at their upper ends and are provided with guides *k* for the valve-stems. Collars *m* are secured on the valve-stems to limit the downward movement of the slide-valves. The ports *e*

being made in the heads of the cylinders A A', the force of the steam is given directly against the pistons.

E indicates the steam-conducting pipes and F the exhaust-pipes, a steam-pipe and an exhaust-pipe being connected with each steam-chest, as shown.

G indicates the standards, which support and form bearings for the shaft of the walking-beam H and also for the crank-shaft J, which carries the balance-wheel K, the said shaft J being provided with the crank *n*. A crank-box *p* is connected with the crank and slides in the frame M, from which extend the arms C, to which the pistons are secured. On the shaft J is fastened a crank-wheel or eccentric L, which is connected with a rod N, which extends downward from the shaft on which the walking-beam is mounted. The connection of the eccentric L with rod N is formed by means of a pin *o*, projecting from the eccentric into a slot *p* in said rod, the pin moving in said slot. A slot *r* is made in eccentric L, and the pin *o*, being threaded at its rear end, may be adjustably secured in the slot by means of a fixed nut *s* and nuts *s'*, one being on each side of the plate, forming the eccentric, as seen in Fig. 4. The pin by this means may be fixed in the slot toward or from the center of the plate, thus regulating the extent of movement as desired.

The walking-beam H, mounted on its shaft with its extremities extending in opposite directions over the valve-stems *g* and *g'*, acts against each of said valve-stems, alternately pressing each stem downward. The upward movement of the slide-valves severally is effected by the steam in the steam-chests pressing upward against the heads *i* in cylinders *h*.

In the drawings, with reference to Figs. 1 and 3 the operating parts are represented as when the steam in cylinder A is forcing forward the piston B, the steam in the chest D pressing upward against the head *i* on valve-stem *g* and raising valve *c*, the walking-beam H is acting against the opposite valve-stem *g'*, pressing it downward and bringing port *e* of cylinder A' in communication with the exhaust-pipe. When the steam enters steam-chest D, it thus raises the slide-valve *c* and then passes through port *e* into cylinder A, acting against piston B, and the walking-



beam acts against the opposite valve-stem, moving down the slide-valve *c'* and letting the steam pass from cylinder *A'* into the exhaust-pipe. Thus the pistons in the two cylinders are alternately operated.

By the construction described much that is employed in the ordinary construction of engines is dispensed with and no packing required, rendering the construction shown comparatively inexpensive. The steam keeping the valve-stems against the walking-beam, but little friction is caused between the parts and less force of steam is required to operate the engine than in ordinary constructions.

The engine is adapted for use in steam-boats, for electric-light purposes, and for any work of a stationary engine.

I claim—

1. In a steam-engine, the combination, with two steam-cylinders placed opposite to each other in horizontal positions and provided with pistons which are connected together, of two steam-chests, each of which is secured in a vertical position to the head of one of said cylinders, and is provided with a steam-port *e* through the head of such cylinder,

der, an exhaust-port *d*, and a cylinder *h*, which extends from the top of said steam-chest, a slide-valve provided with a vertical stem, which extends through cylinder *h* and is provided with a head *i*, which moves in said cylinder *h*, and a walking-beam in position to impinge against the upper end of each valve-stem, substantially as and for the purposes described.

2. The combination, with a horizontal steam-cylinder provided with a port *e* in its head, of a vertical steam-chest *D*, which communicates with said cylinder through the port *e*, and is provided with a cylinder *h*, extending from the top, and a slide-valve provided with a stem *g*, extending upward through said cylinder *h* and provided with a head *i*, which has its movement in cylinder *h*, substantially as set forth and described.

In testimony whereof I have affixed my signature in presence of two witnesses.

MORRIS P. ANDERSON.

Witnesses:

A. KEITHLEY,

L. M. THURLOW.