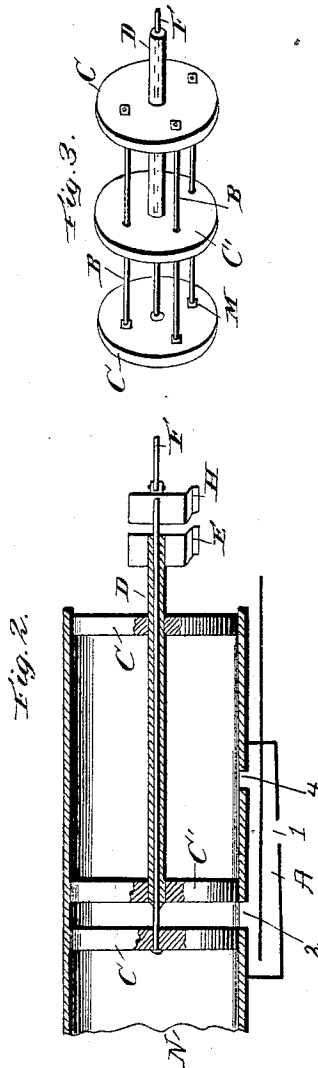
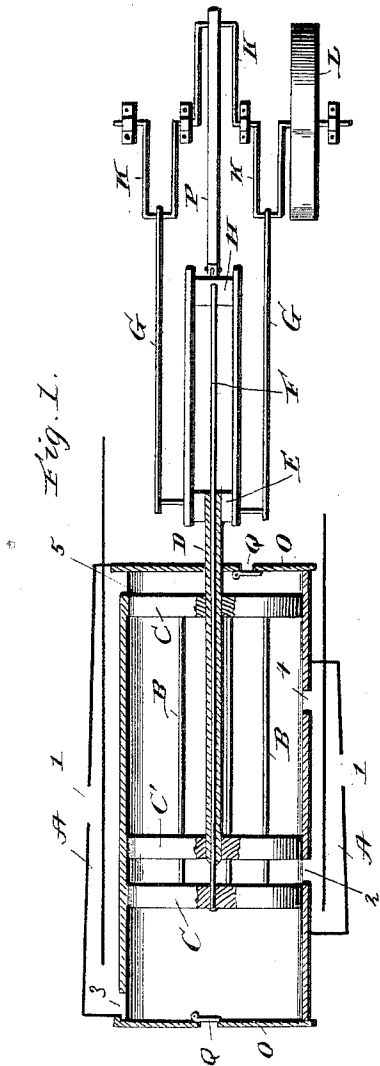


(No Model.)

W. SCOTT & F. FENLEY.
STEAM ENGINE.

No. 462,593.

Patented Nov. 3, 1891.



Witnesses:

James J. Sheehy.

Inventors.

Walter Scott +
Frank Fentley
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Attorney

UNITED STATES PATENT OFFICE.

WALTER SCOTT AND FRANK FENLEY, OF NEW ORLEANS, LOUISIANA; SAID
FENLEY ASSIGNOR TO SAID SCOTT.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 462,593, dated November 3, 1891.

Application filed April 21, 1891. Serial No. 389,872. (No model.)

To all whom it may concern:

Be it known that we, WALTER SCOTT and FRANK FENLEY, citizens of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Steam-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.

Our invention relates to an improvement in a telescope, steam, or other engine, and its novelty will be fully understood from the following description and claims when taken in connection with the annexed drawings; and the objects of our invention are to enable an engine to be operated with or without cylinder-heads in conjunction with three or more piston-heads placed within a cylinder, thereby obtaining greater power with a less amount of steam and a reduction in the size of the engine that has heretofore been required to perform the same work. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top view showing cylinder in section with heads in same, also pitman, cranks, cross-heads, and fly-wheel in position. Fig. 2 is a top view showing cylinder in section without heads, with cranks, pitman, and fly-wheel detached and relative position of cross-heads when pistons are in motion. Fig. 3 is a perspective side view of pistons.

Similar letters and figures refer to similar parts throughout the several views.

In the drawings, A refers to a steam-chest.

B are rods which connect outer pistons C and which pass loosely through center piston C' and upon which rods center pistons slide. The pistons C are placed at a distance apart of, say, two-thirds of the entire length of the cylinder and are attached to rods by nuts M, as shown in Fig. 3.

D is a telescope piston-rod, which takes loosely through the forward piston C and is attached to C' and telescope cross-head E and through which interior piston-rod F passes, the latter connecting the rear piston C with interior piston-rod cross-head H.

G are connecting-rods.

K are cranks.

L is a fly or driving wheel.

P is a pitman.

Q are air-ports, which close when steam is admitted, but which open when steam is shut off, thus preventing a vacuum in end of cylinder.

O are cylinder-heads.

1, 2, 3, 4, and 5 are steam-ports, N showing end of cylinder without head.

In practice steam is admitted at port 1 in steam-chest and flows into port 2 of cylinder, piston C' and piston C on the left of C' being, say, one-fourth of an inch apart, said pistons occupying the position shown in Fig. 1, and when steam enters port 2 all three pistons move simultaneously, thus driving one of the pistons C to 3, piston C' to 4, and piston C nearest cross-head to 4, returning pistons when steam enters 4, and drives piston C nearest cross-head to 5, C' to 2, and piston C farthest from cross-head to 2, causing an exhaust at 2. The above movement can be made without cylinder-heads or a cylinder with heads with air-ports. Thus it will be seen that the movements of pistons C are controlled by interior piston-rod F and cross-head H, while piston C' is controlled by telescope piston-rod D and cross-head E, the cross-heads E and H move back and forth in a slide, and when pistons are in motion the cross-heads E and H are thrown in close proximity, as shown in Fig. 2, by movement of pitman connecting-rods and rods D and F. When it is desired to increase power, steam is admitted at ports 3 and 5, our steam-chest being provided with two ports for admitting steam where cylinder-heads are used, and the cylinder may also be provided with two ports for admitting steam into chest A where no heads are used in cylinder.

A striking advantage of our invention is its economical construction, easy manner by which power can be increased, and utilization of exhaust-steam.

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

In a multiple-piston engine, the combination, with a piston-cylinder having air valves or ports in its rear and forward heads, a steam-

chest, and the ports 2, 3, 4, and 5 between the chest and the cylinder, of two pistons arranged in the cylinder and connected by longitudinal rods, a piston arranged intermediate of the connected pistons and adapted to slide upon the connecting-rods thereof, a hollow piston-rod taking loosely through the forward piston and connected to the intermediate piston, a piston-rod taking through the hollow rod and connected to the rear piston, a slide-casing, a cross-head connected to the hollow piston-rod and adapted to slide in the cas-

ing, a cross-head connected to the solid piston-rod and also adapted to slide in the casing, and pitman-rods connecting the cross-heads with a rotatable crank-shaft, substantially as and for the purpose specified. 15

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

WALTER SCOTT.
FRANK FENLEY.

Witnesses:

HELMUTH HOLTZ,
PERCY D. PARKS.