

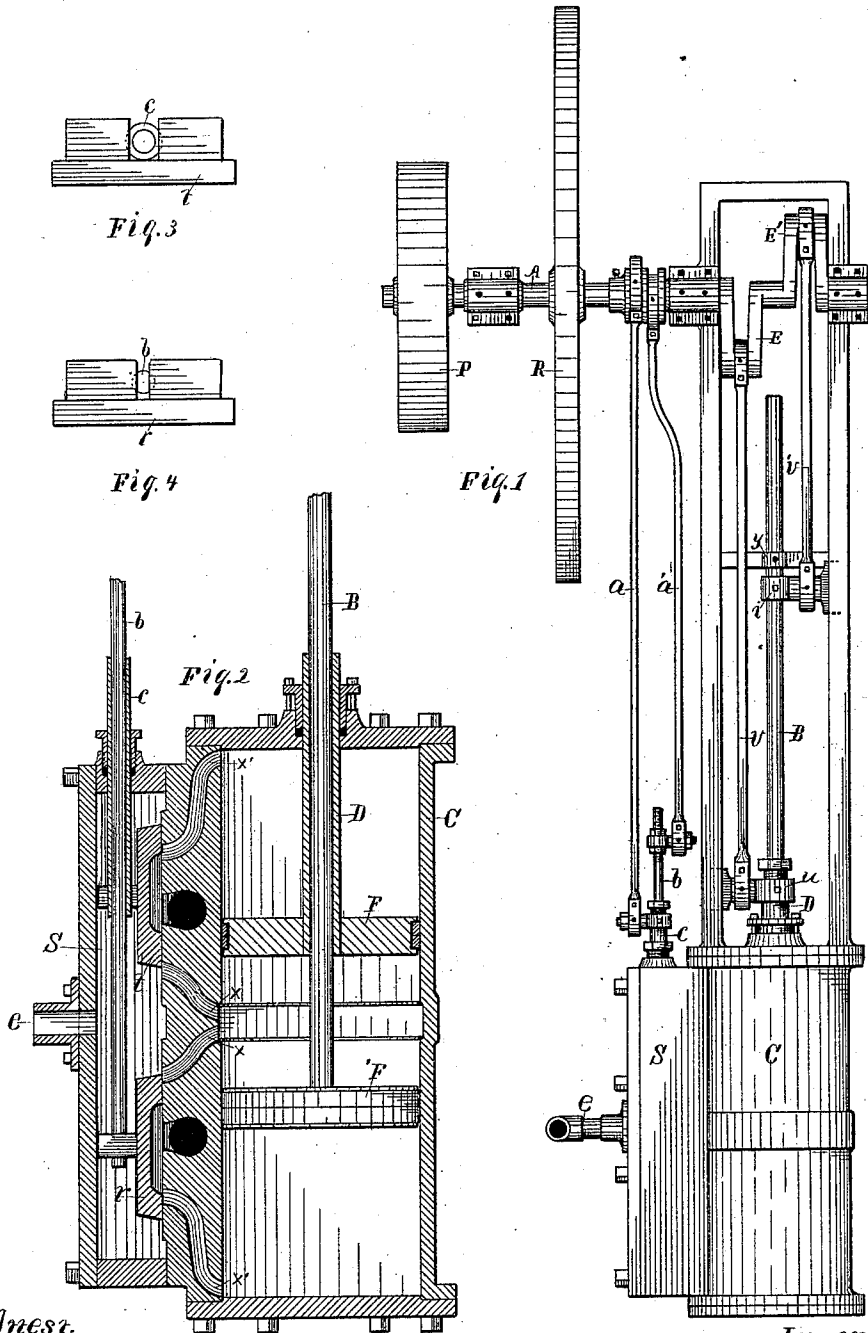
(No Model.)

B. FIELD.

BALANCED STEAM ENGINE

No. 296,944.

Patented Apr. 15, 1884.



Attest.
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UNITED STATES PATENT OFFICE.

BENJAMIN FIELD, OF DAILEY, MICHIGAN.

BALANCED STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 296,944, dated April 15, 1884.

Application filed August 18, 1883. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN FIELD, a citizen of the United States, residing at Dailey, county of Cass, State of Michigan, have invented a new and useful Balanced Steam-Engine, of which the following is a specification.

My invention consists in certain improvements in the construction and arrangement to facilitate the operation and utility of balanced engines.

In the drawings forming a part of this specification, Figure 1 is a top view of the device; Fig. 2, a horizontal section of the cylinder and other parts in Fig. 1; and Figs. 3 and 4 are elevations of the valves in the steam-chest.

One of the pistons has a hollow rod, D, which passes through the cylinder-head. The other piston, B, is passed through said hollow rod of the other piston, Fig. 2. The hollow piston-rod D passes through the cylinder-head. Thus both pistons D B occupy the same place of a single piston. Rods $v v'$ connect the pistons B D with two cranks, E E', on the driving-shaft A. Said cranks are carried out in opposite directions from a line intercepting the axis of shaft A to an equal distance on the same horizontal when in position shown in Fig. 1. The pistons are provided each with a head, F and F', in the cylinder C. The cylinder C has two end ports, $x' x'$, and two center ports, $x x$, leading into it from the steam-chest S, Fig. 2. The two black openings in this figure are exhaust-ports, and e a pipe for connection with the boiler. The steam-chest S is provided with two valves, $r t$, for opening and closing the supply-ports $x x' x'$. Two rods, $b c$, connect with these valves. One rod has a hollow portion which passes through the steam-chest, and the other rod is passed through

said hollow portion with eccentrics of the shaft A.

In the operation, when the steam is admitted into the cylinder through ports $x x$, the piston-heads F F' move from each other. This action exerts a like power or purchase on the cranks E E', and as said cranks are opposite each other, as before explained, the strain exerted on the driving-shaft A is counterbalanced or equalized. When steam enters the end ports, $x' x'$, the piston-heads move toward each other and to the center of the cylinder C, thus continuing the motion with the same counterbalanced force.

An engine thus constructed is free from the difficulty of jarring out of a given location by the force exerted on the ports when running, and hence is of great value in traction-engines and such portable devices.

Having thus described my invention, what I claim, and desire to secure, is—

In a steam-engine, the combination, with a cylinder and steam-chest, each having two intermediate and two end induct-ports, two exhaust-ports, and slide-valves $r t$, of two cut-off-valve rods, one playing through the other, connected by independent eccentrics to the shaft A, two piston-rods which are adapted to play one through the other, having piston-heads F F' and connecting-rods $v v'$, the cranks E E', as specified, and the shaft A, the whole arranged substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in the presence of two witnesses.

BENJAMIN FIELD.

Witnesses:

GEO. B. TURNER,
H. L. GIFFORD.