

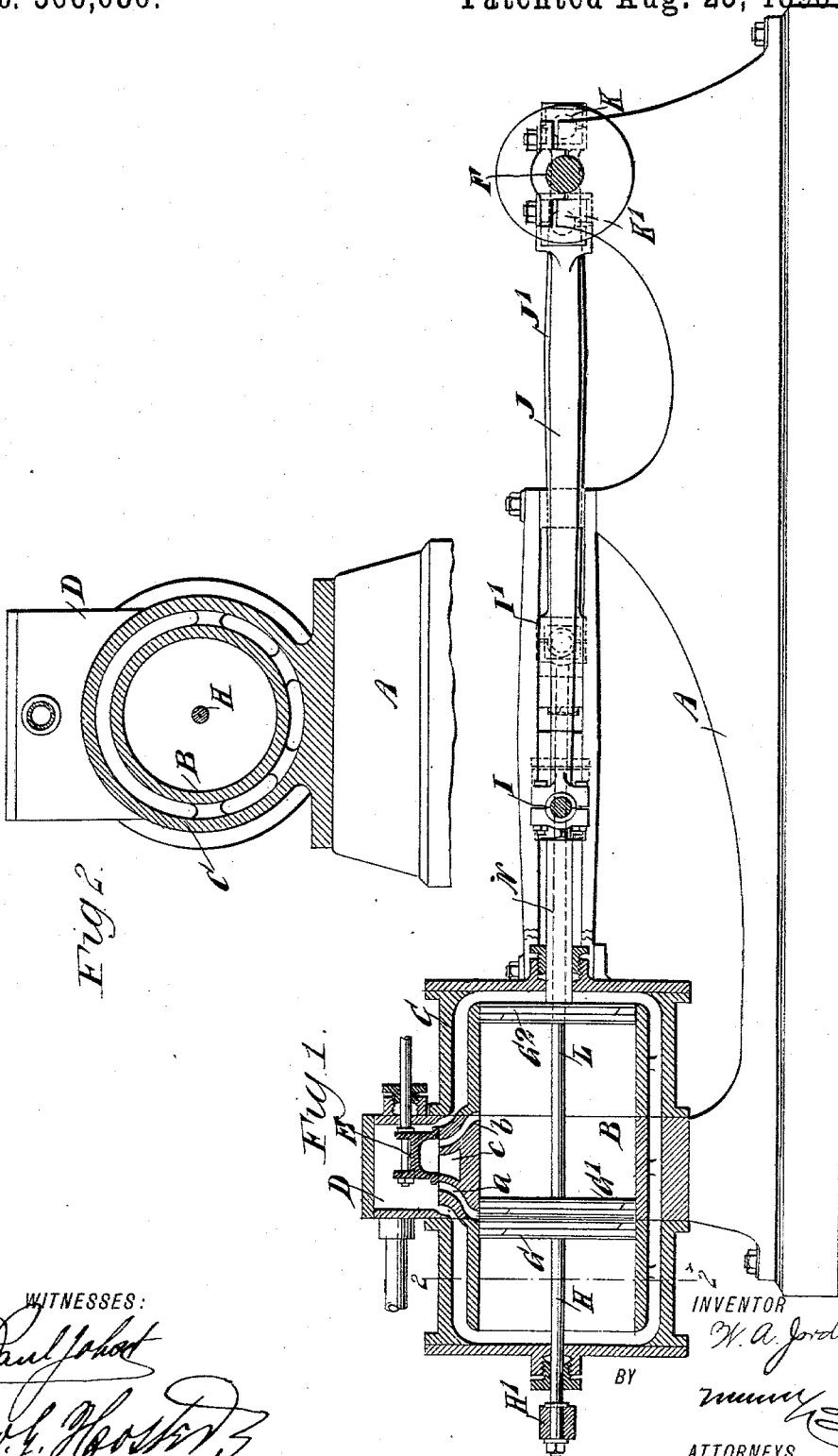
(No Model.)

2 Sheets—Sheet 1.

W. A. JORDAN.
STEAM ENGINE.

No. 566,686.

Patented Aug. 25, 1896



WITNESSES:

Paul J. Hoot

Rev. J. Hoot

INVENTOR

W. A. Jordan

BY

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(No Model.)

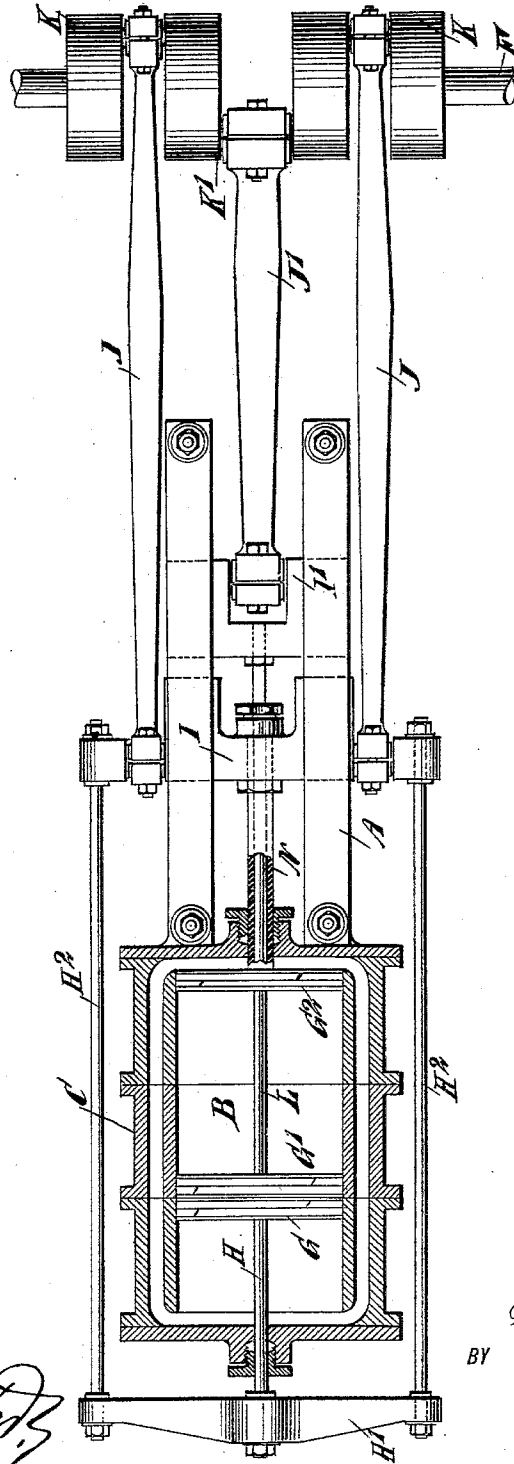
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Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM ALBERT JORDAN, OF MULVANE, KANSAS, ASSIGNOR OF ONE-HALF
TO JEREMIAH A. BELTZ, OF SAME PLACE.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 566,686, dated August 25, 1896.

Application filed March 3, 1896. Serial No. 581,617. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ALBERT JORDAN, of Mulvane, in the county of Sumner and State of Kansas, have invented a new and
5 Improved Steam-Engine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved steam-engine which is simple and durable in construction, very effective in operation, and arranged to utilize
10 the motive power to the fullest advantage.

The invention consists principally of a cylinder connected at its open ends with a steam-chest, said cylinder being also provided with
15 ports leading from the steam-chest to the interior of the cylinder at points approximately one-third the length of the cylinder from the ends thereof, and pistons mounted to travel in said cylinder and connected with the main
20 driving-shaft, one of the pistons traveling between said ports and the open end of the cylinder.

The invention also consists of certain parts and details and combinations of the same, as
25 will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.
30

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a transverse section of the same, and Fig. 3 is a sectional plan view of the same.

35 The improved steam-engine is provided with a suitably-constructed base or body A, on which is mounted a cylinder B, opening at its ends into a jacket C, surrounding said cylinder and connected by ports with the interior
40 of the steam-chest D, containing the usual slide-valve E, reciprocated from the main driving-shaft F in the usual manner. The slide-valve E operates over the live-steam ports a and b and the exhaust-ports c, and
45 the inner ends of said live-steam ports a and b open into the cylinder B at points approximately one-third of the length of the cylinder from the ends thereof, as plainly shown in Fig. 1.

50 In the cylinder B reciprocate the pistons G G' G², of which the piston G moves in that

part of the cylinder located between the port a and the left-hand end of the cylinder, while the piston G' operates in the cylinder between the ports a and b, and the other piston G² 55 travels in that part of the cylinder located between the port b and the right-hand outer end of the cylinder.

The piston G is secured on a piston-rod H, extending through the outer head of the cylinder to connect with a transversely-extending beam H', connected by longitudinally-extending rods H², with a cross-head I fitted to slide in suitable guideways arranged on the base A. The cross-head I is connected by
60 pitmen J with crank arms or disks K, secured on the main driving-shaft F of the engine, as will be readily understood by reference to Figs. 1 and 3.

The middle piston G' is secured on a piston-rod L, extending forwardly and passing loosely through the piston G² and the hollow piston-rod N for said piston G². The outer end of this piston-rod L connects with a cross-head I', likewise fitted to slide in suitable
70 guideways on the base A and in front of the cross-head I, as plainly illustrated in the drawings.

The cross-head I' is connected by a pitman J' with a crank-arm K', secured on the main driving-shaft F of the engine. The hollow rod N' of the piston G² is rigidly connected with the cross-head I, previously mentioned, so that the pistons G G² move simultaneously in the same direction and in opposite directions to that of the piston G', it being understood that the crank-disks K K' are arranged diametrically opposite each other for that purpose, as indicated in the drawings.

The operation is as follows: When the several parts are in the position illustrated in Fig. 1, then the port a is uncovered and takes live steam from the steam-chest D, said live steam passing through the port a into the cylinder, between the pistons G G', close to the said port a, but on opposite sides thereof, as plainly indicated in said figures. The other port b is connected by the slide-valve E with the exhaust, so that any live steam in that part of the cylinder located between the
90 pistons G' G² will be exhausted on the movement of said pistons toward each other. The
95
100

live steam passing between the pistons G G' drives the same apart in opposite directions, and consequently movement is given to the main driving-shaft F by the cross-heads I I', pitmen J J', and crank-disks K K' to rotate said shaft F. At the time the piston G nears the left-hand end of the cylinder A and the piston G' nears the port b, then the other piston G² has moved inward close to the port b, but on the opposite side on which the piston G' is located, and consequently the steam between the said pistons G' G² has been expelled or exhausted. By this time the slide-valve E shifts to the left, to connect the port a with the exhaust-port c and to open the port b to the live steam in the chest D. The steam now passes into the cylinder through said port b between the pistons G' G², to force the same apart and to give another impulse to the main driving-shaft F. As the piston G² travels outward to the right, then the cross-head I causes the piston G to travel inward toward the piston G' until said pistons G G' again assume their adjacent position on opposite sides of the port a, as indicated in Fig. 1. The above-described operation is then repeated.

It will be seen that by the arrangement described the steam acts at all times on two pistons at the same time, so that the steam is utilized expansively and to the fullest advantage. It will further be seen that by having the open ends of the cylinder connected with the interior of the steam-chest there is no vacuum formed in said open ends on the inward movement of the pistons G G².

The steam-jacket C is to furnish the live steam through ports from the steam-chest D around the cylinder B, in which the pistons operate, thereby holding up the temperature of said cylinder-walls to prevent undue condensation of the steam which is being expanded, giving a higher average pressure. The movement of the end pistons to and fro causes a forced circulation of the steam

within the jacket from one end to the other. The condensation within the steam-jacket is carried off by an automatic water-relief cock placed under the rear end of the cylinder. (Not shown.)

It will be seen that by the arrangement described there is no lateral strain between the cylinder and the pillow-block boxing, which strain always exists in an old-style engine.

The engine is perfectly balanced, by virtue of having the pitmen diametrically opposite on the crank-shaft.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A steam-engine, comprising a cylinder connected at its open ends with a steam-chest, said cylinder being also provided with ports leading from the steam-chest to the interior of the cylinder at points approximately one-third of the length of the cylinder from the ends thereof, and pistons mounted to travel in said cylinder and connected with the main driving-shaft, one of the pistons traveling between the ports and the other between the ports and the open ends of the cylinder, substantially as shown and described.

2. A steam-engine, comprising a cylinder connected at its open ends with a steam-chest, said cylinder being also provided with ports leading from the steam-chest to the interior of the cylinder at points approximately one-third of the length of the cylinder from the ends thereof, pistons mounted to travel in said cylinder and connected with the main driving-shaft, one of the pistons traveling between the ports, and the other between the ports and the open ends of the cylinder, and a slide-valve controlling said ports in the steam-chest, substantially as shown and described.

WILLIAM ALBERT JORDAN.

Witnesses:

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WM. H. EGAN.