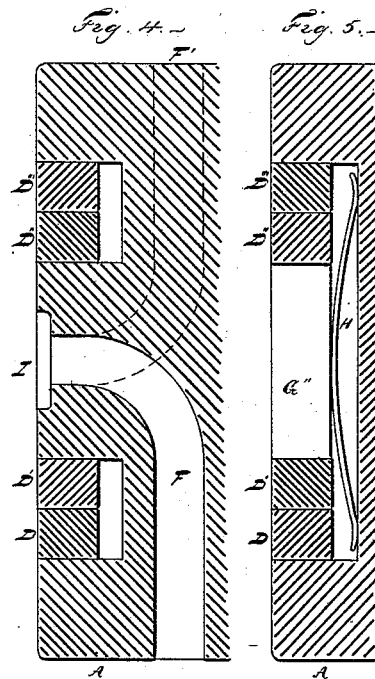
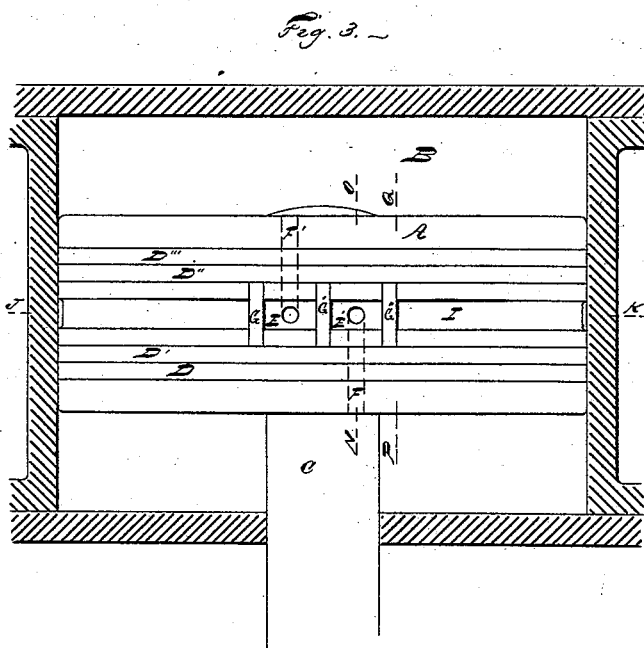
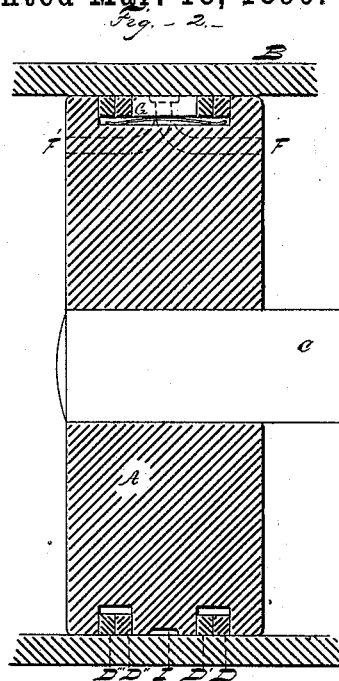
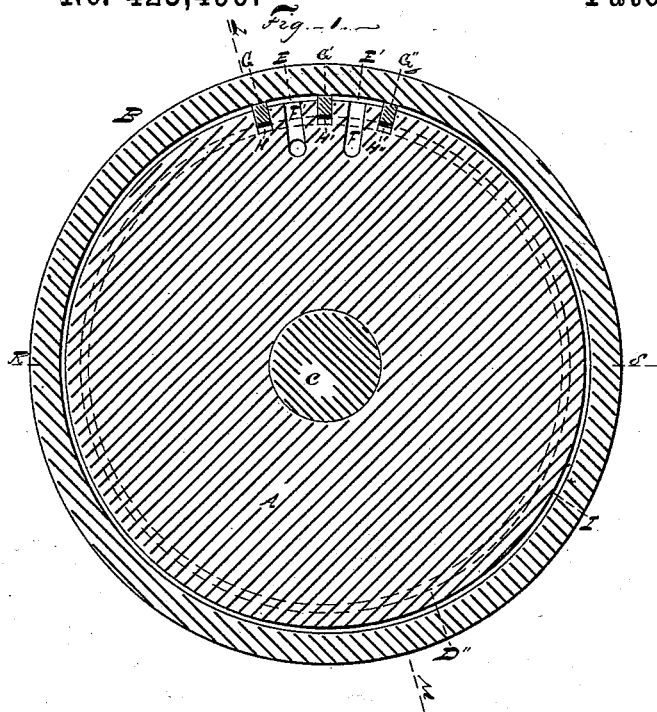


(No Model.)

J. THIERRY.
PISTON.

No. 423,499.

Patented Mar. 18, 1890.



Witnesses:

J. J. Hill
Jas. M. Inman

Inventor:

James Thierry

UNITED STATES PATENT OFFICE.

JAMES THIERRY, OF LARAMIE CITY, WYOMING TERRITORY.

PISTON.

SPECIFICATION forming part of Letters Patent No. 423,499, dated March 18, 1890.

Application filed October 19, 1889. Serial No. 327,534. (No model.)

To all whom it may concern:

Be it known that I, JAMES THIERRY, a citizen of the United States, residing at Laramie City, in the county of Albany and Territory of Wyoming, have invented a new and useful Improvement in Pistons, of which the following is a specification.

My invention relates to improvements in that class of steam-engines in which the cylinder is horizontal; and the objects of my improvement are, first, to reduce the friction of the piston, and, second, to provide for the self-poising of the same. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section on the line J K, Fig. 3; Fig. 2, a vertical section on the line L M, Fig. 1; Fig. 3, a horizontal section on the line R S, Fig. 1; Fig. 4, a vertical section on line N O, Fig. 3; and Fig. 5, a vertical section on line P Q, Fig. 3.

Similar letters refer to similar parts throughout the several views.

A is the piston; B, the cylinder; C, the piston-rod, and D D' D'' D''' the piston-packing rings.

E E' are balance-chambers applied at the top of said piston, provided with steam-passages F F' and limited by said packing-rings and the packing-strips G G' G'', supported on springs H H' H''.

I is an annular recess permanently filled

with live steam during operation, except alternately at the space occupied by either of said chambers during the alternate exhaust of the same through either of said passages. By this arrangement the steam-surface in the upper half of said annular recess is sufficiently reduced to allow the steam in its lower half to carry the weight of said piston and thus reduce the friction and equalize the wear and tear of said piston and cylinder, so that the former will not appreciably wear out of center with the latter.

I am aware that prior to my invention horizontal pistons have been carried or floated by steam. Therefore I do not claim such a combination, broadly; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In horizontal steam-engines, the combination of the piston with packing-strips G G' G'', springs H H' H'', and steam-passages F F', substantially as shown, for the purpose set forth.

2. In horizontal steam-engines, the combination of the piston with the recess I, packing-strips G G' G'', springs H H' H'', and steam-passages F F', all substantially as specified.

JAMES THIERRY.

Witnesses:

W. J. HILLS,

JAS. M. FENWICK.