H. B. Martin.

Steam Engine.

No. 87,419. Patented Mar. 2, 1869.

Fig. 1.

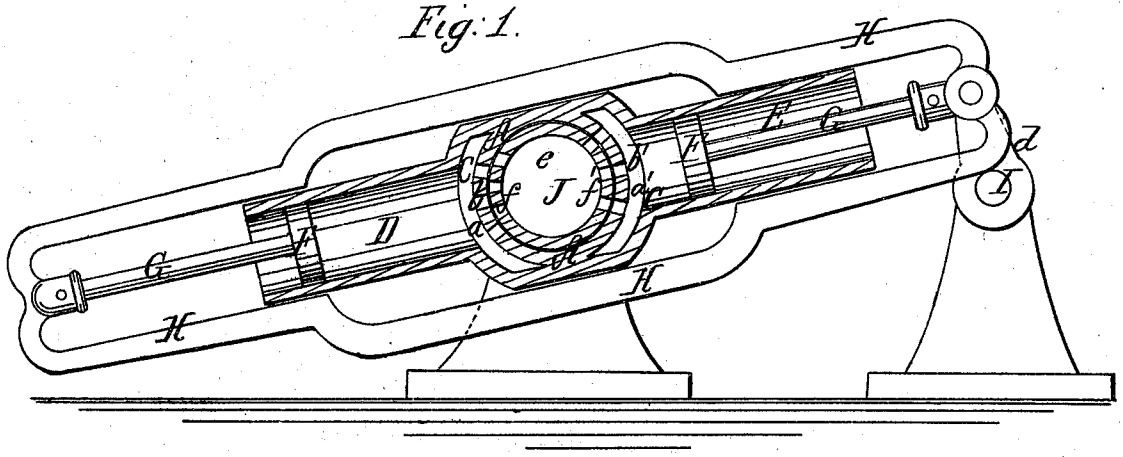
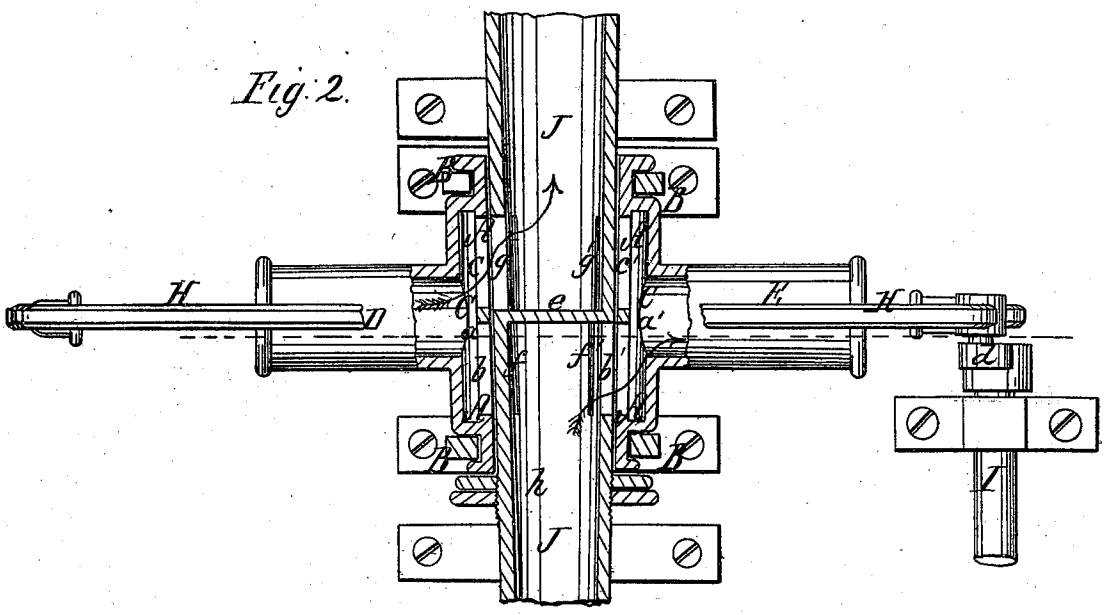


Fig. 2.



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HORACE BARTINE MARTIN, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 87,419, *dated March* 2, 1869.

IMPROVEMENT IN OSCILLATING ENGINES.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, HORACE BARTINE MARTIN, of San Francisco, in the county of San Francisco, and State of California, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a vertical longitudinal section of my improved steam-engine.

Figure 2 is a top view, partly in section, of the same.

Similar letters of reference indicate like parts.

This invention relates to improvements in oscillating steam-engines; and

It consists in the peculiar arrangement of the tubular valve and its ports, with reference to the semi-annular chambers in the cylinder.

The drawings represent a two-ended cylinder, in which two pistons are arranged, they being connected on the outside by means of a yoke.

Steam is alternately let into the cylinder ends, so as to act upon one of the pistons, the cut-off being produced by the oscillation of the cylinder on its axis, which movement is effected by means of the weight of the yoke, and the pistons connected therewith.

If, for example, steam enters one end of the cylinder, so as to force one piston toward the end, the other piston will follow, and the weight of the yoke and of the pistons is gradually carried toward one end of the cylinder, and when the balance is overcome, the weighted end drops down, thereby reversing the parts, letting the steam into the upper end of the cylinder.

The cylinder is, in the middle, crossed by a somewhat conical cylinder, A, which turns in suitable bearings, and which has the ports for the inlet and discharge of steam.

Through the cylinder A fits a pipe, which is divided by a partition, and of which one end serves to let steam into the main cylinder, while through its other end the exhaust is carried off.

A, in the drawings, represents a cylinder of somewhat conical form.

This cylinder has its bearings in suitable supports, B B, and has perforated sides, as shown.

Around the cylinder A is formed a jacket, C, which is rigidly secured, with its ends, to the cylinder, and which forms two nearly semi-annular chambers, *a a'*, around the cylinder, as in fig. 1.

The perforations *b*, *b'*, *c*, and *c'*, that are formed through the cylinder, all communicate with the chamber *a*.

To the jacket C are secured, on opposite sides, and in line with each other, two projecting cylinders, D and E.

In each cylinder is arranged a piston, F, the pistons being attached to rods G G, respectively, that fit through the outer heads of their respective cylinders.

The outer ends of the piston-rods are secured to a yoke, H, so that the pistons must move simultaneously in the same direction. The yoke fits against opposite sides of the cylinders, to have a guidance and to steady the pistons.

One end of the yoke H may, by means of a crank, *d*, be connected with the shaft I that is to be rotated.

Through the cylinder A is fitted a conical tube, J, which is perforated on both sides of a partition, *e*, that is arranged across it, as is clearly shown in fig. 2.

The apertures *f*, *f'*, *g*, and *g'*, through the pipe J, are arranged so that two, diagonally opposite each other, are always in the same relation to the apertures in the cylinder A, next to them.

Thus, when the cylinder D is down, *i. e.*, below the level of the axis of A, the ports *f* and *g'* will be closed, and not in communication with the chamber *a*, while those, *f'* and *g*, are open, and communicate with the chamber *a*.

The steam or other fluid, entering the pipe J at the end, *h*, in which the ports *f f'* are arranged, will then only be able to pass through the then open ports, *f'*, *b'*, into the chamber *a'*, and thence into the cylinder E, forcing the piston toward the outer end of such cylinder. The yoke will follow the motion of such piston, and will draw the piston in the other cylinder D, in the same direction.

This latter piston forces the steam contained in B out through the ports *c g*.

When the yoke and pistons have so far travelled in one direction that the swinging-apparatus finds its equilibrium, it will swing to a level and close all the ports, but then the fly-wheel will carry the shaft around sufficiently far, and move the yoke sufficiently, to cause the yoke to lose the equilibrium, and to tip, with the cylinder E, downward. Thereby the ports *b' f'* and *c g* will be closed, and *b f* and *c' g'* are opened, so that steam enters D and leaves E.

In this manner the machinery will be kept going, swinging constantly around the fixed pipe J.

The latter being conical, as shown, can always be made to fit tight into the inside of A.

By slightly turning the pipe, or tumbler, J, the arrangement of ports may be reversed, so as to reverse the machine.

Thus, in the position shown in fig. 1, when D is down, the pipe J may be so turned that the ports *b f* and *c' g'* may be open, and *b' f'*, *c g*, closed. This, it will be noticed, is the reverse to the position of ports shown.

This engine may be advantageously employed, for pumping and other purposes, as an engine or pump.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

The arrangement of the tubular valve J, having its ports *g g'*, *f f'*, with relation to the ports *b b'*, *c c'*, and the semi-annular spaces *a a'*, as herein shown and described.

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