J. A. Whipple,

Rotary Steam Engine.

No. 23,993. Patented May 10, 1859.

Fig. 1

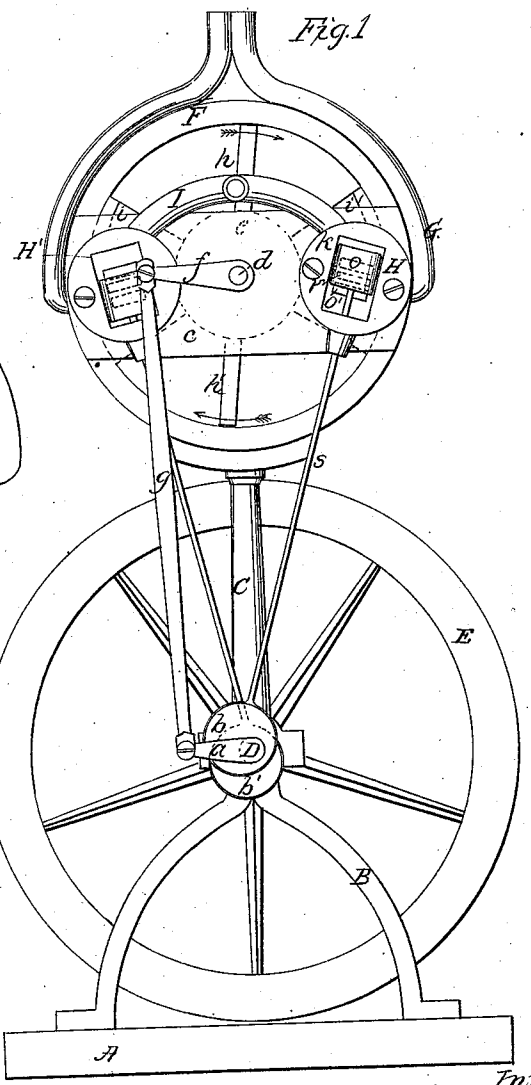


Fig. 2.

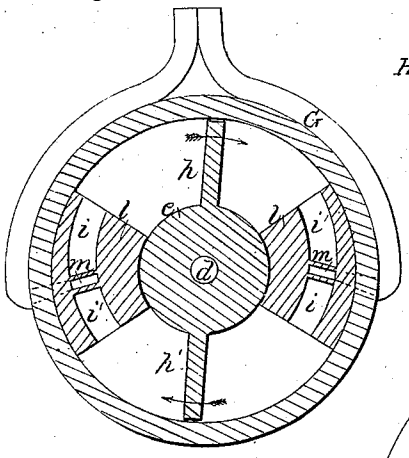
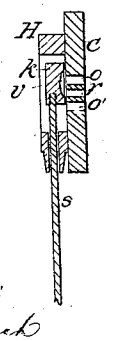


Fig. 3



Witnesses:
Thos. A. Coach
R. E. Tschumacher

Inventor:
Jas. A. Whipple

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES A. WHIPPLE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO JAMES WHIPPLE AND BENJ. F. COOKE, OF SAME PLACE.

STEAM-ENGINE.

Specification of Letters Patent No. 23,993, dated May 10, 1859.

To all whom it may concern:

Be it known that I, JAMES A. WHIPPLE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Intermittent Rotary Steam-Engine, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation, with part of the casing of the cylinder removed; Figs. 2 and 3 details to be referred to.

That others skilled in the art may understand and use my invention I will proceed to describe the manner in which I have carried out the same.

In the drawings A is the bed plate from which rise the stanchions B and pillars C (only one pair of these stanchions and one pillar are shown the others being immediately behind them). In suitable bearings at the base of the pillars C is a shaft D which carries a fly wheel E, a crank *a* and two eccentrics *b*, *b'*. On the top of the two pillars C is supported the cylinder F a part of the head *c* of which is removed. Through the center of this cylinder F passes a shaft *d* which has its bearings in the heads *c* and carries within the cylinder a hub *e* (shown dotted in Fig. 1,) and at the end of the shaft outside of the cylinder, a crank *f* to which is pivoted a connecting rod *g* the other end of which is pivoted to the crank *a;* so that as the shaft *d* and hub *e* are rotated back and forth for a portion of a revolution in a manner which will be presently explained, the shaft D and fly wheel E are caused to revolve (the lengths of the cranks *f* and *a* bearing a suitable relation to each other). To the hub *e* is attached at top and bottom the pistons *h*, *h'* of sufficient length and width to fill the space between the heads *c* of the cylinder F and to run in contact with the rim or circumference of it. These pistons as well as the hub *e* are made steam tight by suitable packings.

A portion of the space within the cylinder F is occupied by two partitions *l* which serve as heads one on each side of the hub *e* (these may be cast with the cylinder F). In one of the faces of each of these heads *l* is formed the steam ways or channels *i i'* (see Fig. 2) and the outlet *m*, the latter connecting by a hole through the rim of the cylinder F with the exhaust pipe G. To one of the heads *c* of the cylinder F are attached the valve chests H H' one over each head *l*, these communicate with the steam pipe I (as they are similar I will describe but one of them). Through the bottom of the valve chest H and head *c* are cut suitable openings or ports *o* communicating with the channel *i'* and *o'* with the channel *i*, and an exhaust port *r* communicating through the outlet *m* with the exhaust pipe G (these ports are dotted in Fig. 1). The valve *k* is attached to a rod *s* passing through a stuffing box in the side of the valve chest H and connected by a strap with the eccentric *b*.

Operation: The following is the operation of this engine—Steam is admitted from the pipe I to the valve chest H, it passes thence through the port *o'* and channel *i* to the piston *h'* which is driven in the direction of its arrow. At the same time the steam space in front of the piston *h* communicates through the channel *i'* port *o* and exhaust port *r* with the exhaust pipe G. The same state of things is taking place in the valve chest H' except that as the eccentric *b'* which operates this valve *k* is set opposite to the eccentric *b*, it will be admitting steam behind the piston *h* to drive it in the direction of its arrow, while it exhausts from in front of the piston *h'*. When the pistons *h h'* and hub *e* have revolved sufficiently far within the cylinder F to bring the pistons nearly into contact with the heads *l*, the crank *a* will be carried over its center, the valves *k* will be thrown into a position to admit steam on the opposite side of each piston, and drive the pistons in the contrary direction, the steam exhausting through the port at which it previously entered, viz. through port *o'* and exhaust port *r* which are now brought into communication by the space *v* in the underside of the valve *k*.

It will thus be seen that the pistons *h. h.'* may be perfectly balanced by the pressure of the steam on their faces, while the shaft *d* receives a regular reciprocating or intermittent rotary motion, or part revolution back and forth. There are many situations where such a reciprocating motion is required (for

example in pumping or driving a reciprocating saw) and where the power of the engine above described may be applied, through the shaft *d*, directly to the work without intermediate gearing.

Instead of the two valve-chests H, H′ and their valves, the engine may be operated by a single valve; proper communications being established by suitable pipes and channels from the steam and exhaust ports to the opposite sides of each piston *h*, *h′*.

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

The above described intermittent rotary engine consisting of the cylinder F the heads *l* and pistons *h*, *h′* operating in the manner substantially as described.

JAMES A. WHIPPLE.

Witnesses:
THOS. R. ROACH,
P. E. TESCHEMACHER.