D. H. ISEMINGER.

RECIPROCATING ENGINES.

No. 195,013. Patented Sept. 11, 1877.

Fig. 1

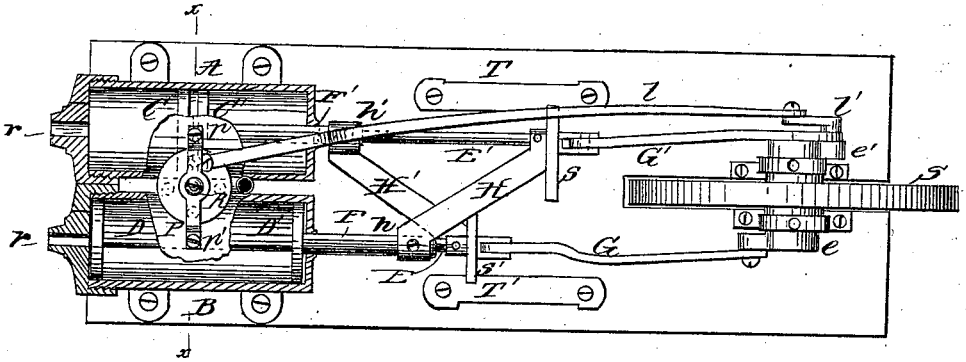


Fig. 4.

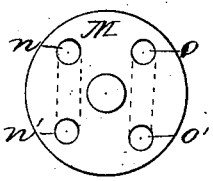


Fig. 2.

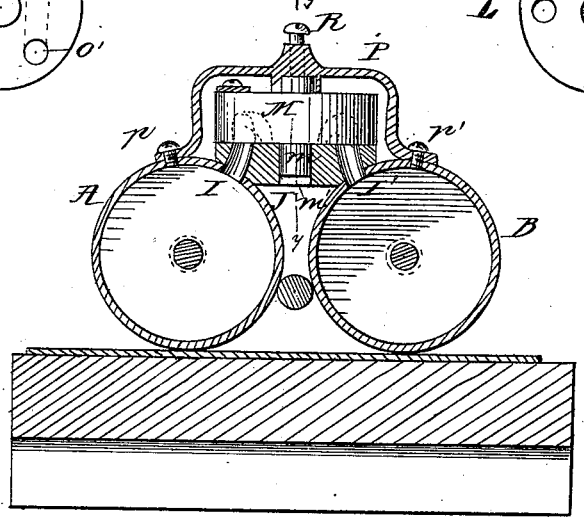


Fig. 5.

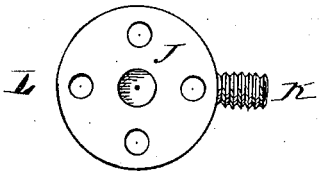
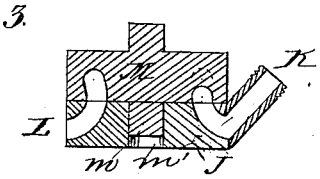


Fig. 3.



Witnesses.

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atty

UNITED STATES PATENT OFFICE.

DANIEL H. ISEMINGER, OF BLOOMINGTON, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO MATTHEW FALOON, OF SAME PLACE.

IMPROVEMENT IN RECIPROCATING ENGINES.

Specification forming part of Letters Patent No. **195,013**, dated September 11, 1877; application filed February 26, 1877.

To all whom it may concern:

Be it known that I, DANIEL H. ISEMINGER, of Bloomington, in the county of McLean and in the State of Illinois, have invented certain new and useful Improvements in Steam-Engines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to that class of steam-engines in which the steam is introduced between the pistons, whereby the full expansive force of the steam is exerted upon the main shaft; and the invention consists in the combination of two cylinders, each provided with two pistons, and a valve arranged to alternately introduce the steam between the pistons in each cylinder. It further consists in the combination and arrangement of the several parts, as will be hereinafter more fully described.

Figure 1 is a top or plan view of my invention with the cylinders broken away to show the pistons therein. Fig. 2 is a vertical cross-section through the line *x x* of Fig. 1; Fig. 3, a vertical cross-sectional view through the line *y y* of Fig. 2. Figs. 4 and 5 are detail views.

In the drawing, A and B represent the two cylinders. C and C′ represent the two pistons in the cylinder A, and D and D′ the two pistons in the cylinder B. The pistons C′ and D′ are connected to tubular piston-rods F and F′, through which pass piston-rods E and E′, to which the pistons C and D are connected. The piston-rods E E′ are attached to crank-arms *e e′* on the ends of the main shaft by connecting rods or pitmen G G′.

The tubular piston-rod F is adjustably connected by sleeve *h* and cross-arm H to the end of the piston-rod E′, and the tubular piston-rod F′ is adjustably connected by sleeve *h′* and cross-arm H′ to the end of piston-rod E, whereby the pistons C and C′ in cylinder A are made to move in an opposite direction from the pistons D and D′ in cylinder B.

The arrangement of the pistons and piston-rods for the two cylinders is such that as the main shaft revolves the pistons C C′ and D D′ are moved in opposite directions, and approach each other when opposite the steam-ports I and I′, and, when thus opposite, the cylinder A is taking steam between the pistons C and and C′, and the cylinder B exhausting steam between the pistons D and D′, all as clearly shown in Fig. 1.

I and I′ are the steam-ports, which lead to the cylinders A and B, and they open out into the cylindrical steam-chest J, which is provided with steam induction-port K and exhaust-port L. (See Fig. 5.) This steam-chamber has a circular or disk valve, M, operated from one of the crank-arms *e* through the medium of a connecting-rod, *l*, and crank-arm *l′*.

The valve M is provided with a stem, *m*, which fits into a corresponding opening, *m′*, in the steam-chamber, and upon which the valve oscillates. The valve is also provided with communicating openings *n n′* and *o o′*, (see Fig. 4,) arranged at equal distances apart, so that a communication is established between the steam-induction opening and one of the steam-ports, and also at the same time between the exhaust-port and the other steam-port.

The valve receives an oscillating or partially revolving movement of about ninety degrees, so as to alternately open communication between the two cylinders and the induction and exhaust ports, and allow the steam to alternately act upon the pistons in said cylinders.

By the above construction of steam chest and valve, steam is alternately admitted between the pistons in each cylinder, and while steam is being admitted through either one of the steam-ports I and I′, into one of the cylinders, the other steam-port becomes an escape-port for the steam that fills the space between the pistons in the other cylinder.

The effect of the steam is therefore to force the pistons apart alternately in such one of the cylinders, whereby the whole of the moving power thus imparted is exerted directly upon the main shaft.

The valve M is secured in place by the head P, which in turn is secured by the screws *p p′* to the cylinders A and B′, and the valve can be adjusted to its seat by the set-screw R.

It will also be observed that the crank-arms *e e′* are upon the ends of the main shaft, and

upon opposite sides of the fly-wheel S, thereby giving a steady motion to the operating mechanism. The piston-rods and connecting-rods are supported and slide upon guide-bars T and T′ by means of the lateral bars *s* and *s′*.

r r are holes in the end of each cylinder, for the purpose of allowing the escape of any steam that may work into the ends, and also to admit of an extension of the piston-rods through them, thus keeping them from resting on the bottom of the cylinders, thereby preventing any friction and wear of them.

I do not desire to limit myself to the form and construction of valve and steam-chest herein described, as any other well-known form of valve and steam-chest for accomplishing the same results could be substituted therefor without departing from the spirit of my invention.

I claim as my invention—

1. The combination of two cylinders, each provided with two pistons, and a valve arranged to alternately admit or introduce steam between the pistons in each cylinder, substantially as and for the purpose specified.

2. The combination of the pistons C C′ D D′, piston-rods E E′, tubular piston-rods F F′, and cross-arms H and H′, all arranged as herein shown and described, whereby the pistons in one cylinder are moved in an opposite direction from the pistons in the other cylinder, substantially as specified.

3. The combination of the steam-chest provided with the steam-ports I I′, induction-port K, and exhaust-port L, and valve M, having communicating-openings *n n′* and *o o′*, whereby the steam is alternately admitted and exhausted from the cylinders, substantially as herein shown and described, and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of February, 1877.

DANIEL H. ISEMINGER.

Witnesses:
THOS. SLADE,
WILLIAM P. MCMURRY.