J. M. MARTY.

Steam-Engine.

No. 162,485. Patented April 27, 1875.

Fig. 1.

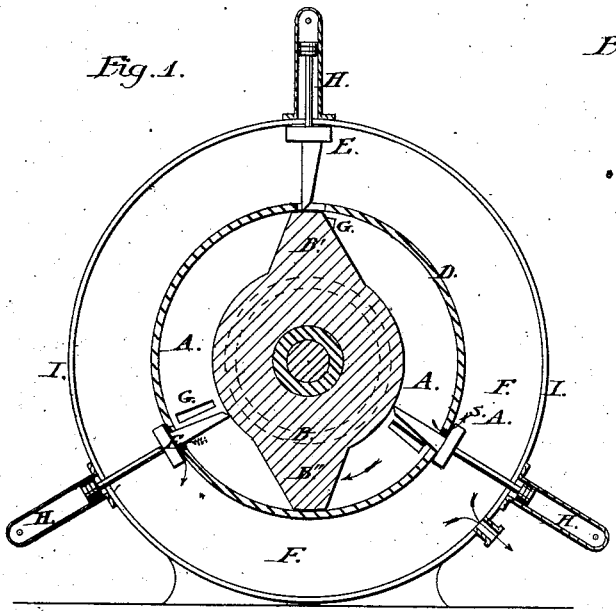


Fig. 2.

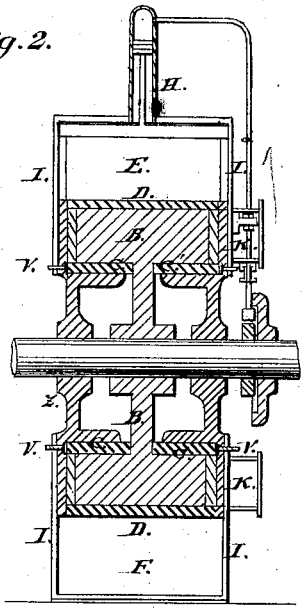


Fig. 3.

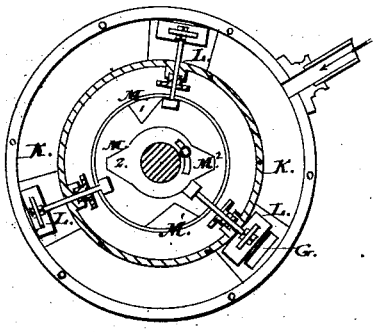


Fig. 4.

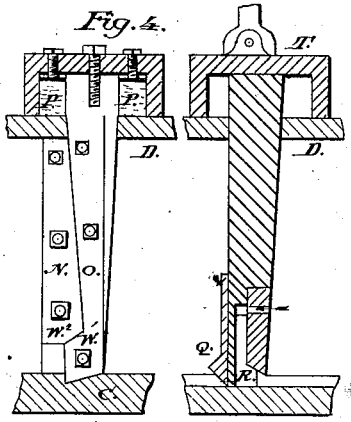


Fig. 5.

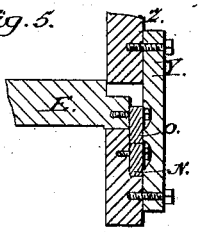


Fig. 6.

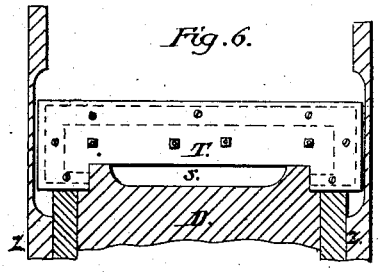


Fig. 7.

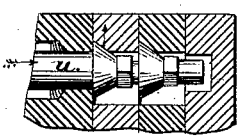
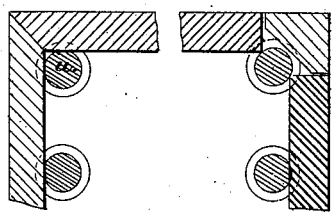


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN M. MARTY, OF LA CROSSE, WISCONSIN.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **162,485**, dated April 27, 1875; application filed April 14, 1875.

To all whom it may concern:

Be it known that I, JOHN M. MARTY, of the city of La Crosse, La Crosse county, Wisconsin, have invented an Improved Steam-Engine, of which the following is a specification:

The object of my invention is to combine the best advantages of the rotative engines with those of the rotary engines by the following constructions, (see accompanying plan:)

Figure 1 represents cut of machine right angle to shaft; Fig. 2, cut along and through center of shaft; Fig. 3, steam-chest.

The steam enters through pipe, as shown in Fig. 3, and fills the steam-chest K K all around. Three port-holes, G, open into space A, Fig. 1. Said space A is divided, by three sliding abutments, E E E, of peculiar construction, hereinafter described, into three spaces or chambers. The ring D forms the outer, the two rings C and C′, Fig. 2, the inner, covers of the chambers A A A. D is cut into three different sections, allowing the passage of the abutments E E E through or between them.

Figs. 1 and 2 show the runner B on shaft, with two pistons, B^1 and B^2, attached. One piston is shown as just entering from one chamber into another, while the one opposite is, under full steam, going in the direction as shown by the arrow. As soon as the upper piston moves a little farther, the sliding abutment which it had lifted falls down, pressed by steam acting against the end of a small piston attached to top of abutment E, said pistons working in a small tube, H, the upper end of which is connected with the steam-chest by means of a small pipe, as shown in Fig. 2, thus giving a constant and sufficient pressure to the abutment to push it back whenever lifted. The moment the abutment is pressed in against the rings C C′, the port-hole nearest to it and immediately behind it opens and lets in steam, as it would into any common engine. The steam presses against the abutment and the piston. While the piston is in motion the other one reaches the abutment to the left below, and the same operation repeats. The port hole or holes can be shut at any moment by moving the cam M^2, as shown in Fig. 3, closer toward the pieces M^1 in same figure. The closer they are moved toward these pieces the sooner the valves will shut, and the more will the steam in the chambers work by expansion, M^1 designating the stationary openers of the valves; M^2, the movable closers of the same. The exhaust steam passes through the openings S, Figs. 2 and 6, into chamber F, which extends concentrically around the three chambers A, and serves for the double purpose of carrying off the steam through the exhaust-pipe and keeping the inner chambers hot. The rings C C′ are fitted into the side pieces Z Z in the manner shown in Fig. 2, and can be pressed at will toward the runner B by means of set-screws V. Between the set-screws and the rings is suitable packing. The manner in which the sliding abutments work is illustrated in Figs. 4 and 5.

In Fig. 4 *a* shows the outside abutment-slide, made of tempered steel. O is fastened to the sliding abutment. N is stationary on cylinder side. T represents the head or top piece of the abutment; D the outside, and C and C′ the inside, ring of cylinders or chambers A. P represents the packing. As soon as the abutment is pressed back by the entering steam, it is also pressed downward by the wedge-like shape of the slides, as marked by letter W. The packing P will be pressed onto cylinder-rim D with corresponding power all around the opening, through which the abutment plays, except in the center of the exhaust side.

In Fig. 4 *b* represents cut through center of abutment, Q being a steel projection, on which the runner B lifts; R, a movable piece of metal, pressing on the central portion of the runner, and packed by steam acting through an opening above, and pressing it toward the runner. The off steam or back side of the abutments has to be perfectly true, and fit close to the openings in the sides Z Z, thus preventing any escape of steam. The steel slides have to project enough to prevent the rubbing of the cast-iron portions, they only touching each other when the abutment is shut.

The packing can very easily be adjusted in the following manner: Put the packing in between the top piece and the abutment itself, slide the abutment in, press the runner backward onto the abutment, and turn the set-screws on top down, compressing the packing. The rod, connecting the abutment with the small piston in H, has a hinge-joint, (Fig. 4 *b*,

top,) giving the abutment some play. Y represents the covering of the outside—on the side without the steam-chest; on the other the steam-chest will answer the same purpose.

Fig. 6 represents the top of the abutments, the hexagon bolts representing the screws connecting abutment and top, the round ones the set-screws. The runner B consists of a round flange, with a hub in center, and two pistons, B^1 and B^2, cast to it.

Fig. 7 represents part of a piston, together with an automatic packing.

Pins U are fitted in the cover, and in front packed by a small stuffing-box. The pistons have a double line of metal packing all around, inside as well as outside.

Fig. 8 shows this packing; the right-hand view is the first, the left-hand one the second lining, so as to show the overlap of their joints. As soon as the steam presses these pins U inward, they will, by means of little cones, as shown in drawing, press upon the packing, thus pressing them toward the cylinder sides outside as well as inside, thus securing a good and lasting packing. The cones are adjustable, as they have threads inside, which fit onto the pins, so that, the packing becoming smaller, they can be set forward.

The thin flange-like central portion of the runner B has for its object to diminish the pressure of the steam upon the running portion, and substituting therefor the rings C C′, which are a part of the fixtures, being the inside cover of the cylinders or chambers A, and which can only be moved by the set-screws V, as above described.

I claim as my invention—

1. The combination of the pistons in the tube H, provided with link-connection, the abutment E, and pistons B^1 B^2, substantially as and for the purpose specified.

2. The combination of the abutment E, box I, and packing P, substantially as and for the purpose specified.

3. The combination of the abutment E, slide O, having incline W^1, and stationary piece N, having corresponding incline W^2, substantially as and for the purpose specified.

4. The combination of the abutment E, projection Q, and packing R, substantially as and for the purpose specified.

5. The combination, with packing-strips having a portion of their inner periphery inclined, as set forth, of the adjustable automatic valve, the same consisting of a spindle provided with adjustable cones, substantially as shown and described.

6. The combination, in a rotative engine, of the adjustable cam M^2, stationary M^1, and the valves which control the steam-ports, substantially as and for the purposes set forth.

7. The combination of the runner B with packing-rings C C′ and set-screws, the said packing-rings being supported by flanges formed solid with the sides of the casing, and serving to pack the inner periphery of the runner, and also forming a portion of the casing of the annular steam-chest, substantially as shown and described.

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