(No Model.) 2 Sheets—Sheet 1.

D. DRAKE.

ROTARY ENGINE.

No. 603,679. Patented May 10, 1898.

Fig. 1.

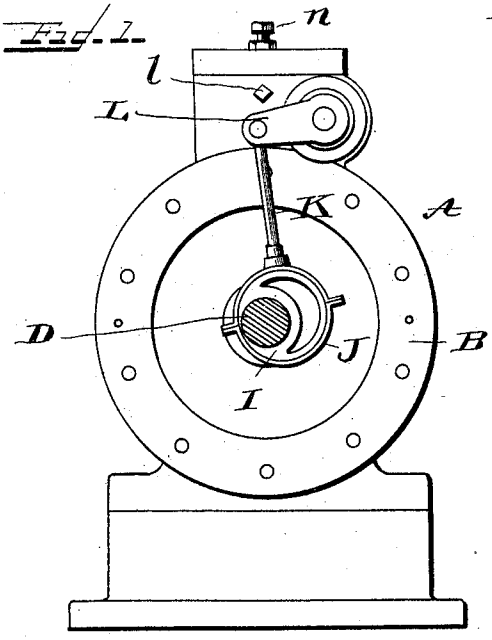


Fig. 2.

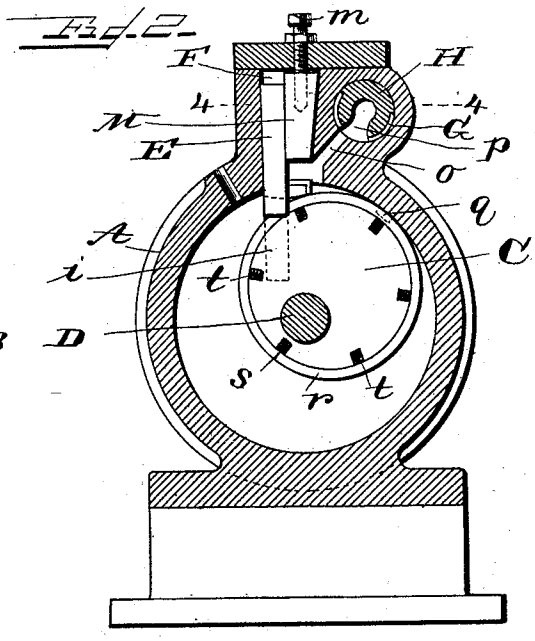


Fig. 3.

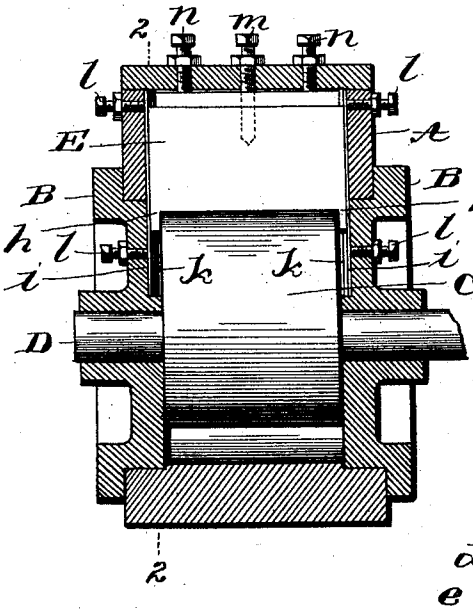


Fig. 4.

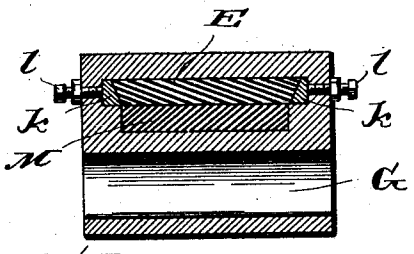


Fig. 5.

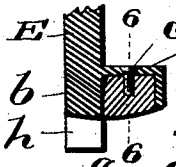
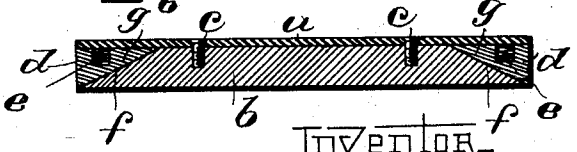


Fig. 6.



Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

D. DRAKE.

ROTARY ENGINE.

No. 603,679. Patented May 10, 1898.

Fig. 7.

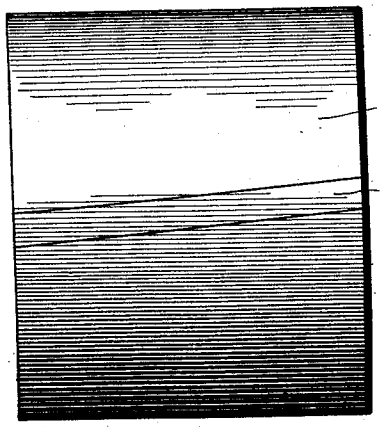


Fig. 8.

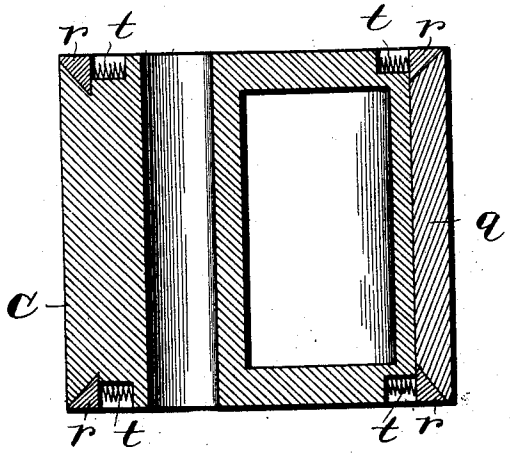


Fig. 9.

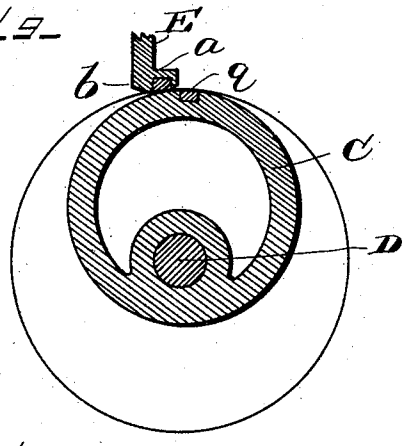


Fig. 10.

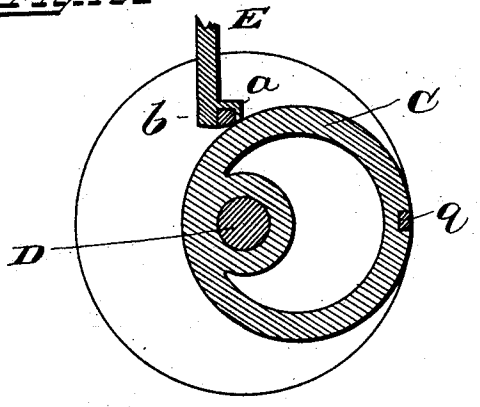


Fig. 11.

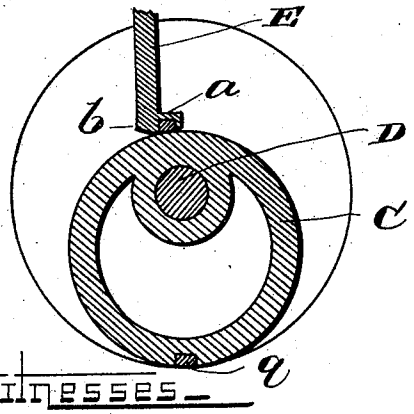
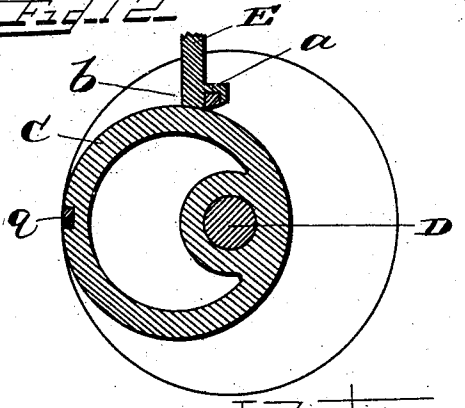


Fig. 12.



Witnesses—

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By D. C. Reinold

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UNITED STATES PATENT OFFICE.

DUDLEY DRAKE, OF NEWARK, NEW JERSEY.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 603,679, dated May 10, 1898.

Application filed May 7, 1897. Serial No. 635,559. (No model.)

To all whom it may concern:

Be it known that I, DUDLEY DRAKE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to rotary steam-engines, and has especial reference to that class in which an eccentric piston and a movable abutment are used; and it consists in certain improvements in construction, which will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a side elevation of the engine; Fig. 2, a vertical transverse section on line 2 2, Fig. 3; Fig. 3, a vertical longitudinal section of the cylinder, the piston being shown in side elevation; Fig. 4, a transverse section through the abutment-chamber and the valve-chamber on line 4 4, Fig. 2, the valve being omitted; Fig. 5, a vertical transverse section, on an enlarged scale, of the lower end of the abutment; Fig. 6, a vertical longitudinal section of the foot of the abutment on line 6 6, Fig. 5; Fig. 7, an enlarged side elevation of the piston detached, showing its peripheral packing-strip; Fig. 8, a vertical longitudinal section of the piston; Figs. 9, 10, 11, and 12, diagrammatic views showing, respectively, the piston and abutment in their relative positions during one revolution of the piston.

Reference being had to the drawings and the letters thereon, A indicates the cylinder; B B, the cylinder-heads, secured in the usual manner by dowel-pins and bolts or in any preferred manner; C, the piston, which is eccentrically supported upon shaft D; E, the abutment; F, the abutment-chamber; G, the valve-chamber and steam-chest; H, the valve; I, the eccentric on the shaft D; J, the eccentric-strap; K, the rod, and L the crank on the end of the valve H, which is of the semirotary type.

The abutment E is provided with a laterally-extending foot or flange *a*, in which a packing *b*, of metal, is secured on the piston-bearing surface of the abutment by screws *c c*, and on the ends of the packing *b* are free angular metallic packing-pieces *d d*, provided with spirally-coiled springs *e e* to press said packing-pieces outward to pack the edges of the lower end of the abutment against the heads of the cylinder, the packing sliding on the inclined surfaces *f f* of the packing *b* and their own inclined surfaces *g g*, which rest upon the surfaces *f f*. The abutment is also provided with extensions *h h*, which engage the grooves *i i* on each end or head of the cylinder.

The edges of the abutment are angular, as shown in Fig. 4, and are packed by angular metallic packing-pieces *k k*, adjusted by set-screws or bolts *l l*, and said packing-pieces extend down from the abutment-chamber F into the grooves *i i*, as shown in Fig. 3.

The abutment is held in vertical position and wear upon its side taken up or compensated by a wedge M, which is supported in the abutment-chamber by a screw-bolt *m* and adjusted by bolts *n n* as the side of the abutment wears, and from the abutment-chamber extends a steam port or passage *o* to the steam or valve chest G, the steam being admitted at the end of the chest opposite the crank L and is contained in the chamber *p* of the valve H.

The piston C is provided with a peripheral packing *q*, which extends diagonally across the piston, or at an angle to a horizontal plane, as shown in Fig. 7, and angular end packing-rings *r r*, which are split, as at *s*, (see Fig. 2,) and expanded by spiral springs *t* to pack to ends of the piston, and as the rings are expanded they press the peripheral packing *q* outward and hold it in engagement with the wall of the cylinder. The angularity of the packing *q* enables it to pass under the abutment in its revolution without injury thereto.

As steam enters the cylinder through passage *o* it impinges upon the laterally-extending foot or flange *a* and securely holds the abutment in contact with the periphery of the piston C while the engine is taking steam and until the piston has passed the lower center or half of its revolution, as shown in Figs. 9, 10, and 11, and by the time the piston has

made three-fourths of its revolution the pressure on both sides of the foot is nearly equal, as shown in Fig. 12, and the piston has substantially only the weight of the abutment to raise to its normal position in the abutment-chamber.

Having thus fully described my invention, what I claim is—

1. A rotary engine having an eccentric piston, an abutment provided with a laterally-extending flange, and angular edges extending beyond the foot, grooves in the heads of the cylinders and packing-strips in said grooves, in combination with a wedge for adjusting the abutment.

2. A rotary engine having an eccentric piston provided with a diagonal peripheral packing and angular end packing-rings engaging said peripheral packing with their inclined surfaces, in combination with an abutment having a laterally-extending foot or flange supporting a packing to engage the piston, and means for adjusting the abutment.

3. A rotary engine having an eccentric piston, an abutment provided with a laterally-extending foot or flange and angular edges extending beyond said foot, in combination with grooves in the ends or heads of the cylinder and angular packing-strips in said grooves.

4. A rotary engine having an abutment provided with a laterally-extending foot or flange, a fixed central packing-piece and laterally-movable end packing-pieces supported in the extension of said foot.

In testimony whereof I affix my signature in presence of two witnesses.

DUDLEY DRAKE.

Witnesses:
JACOB CLARK,
THOMAS B. BURTON.