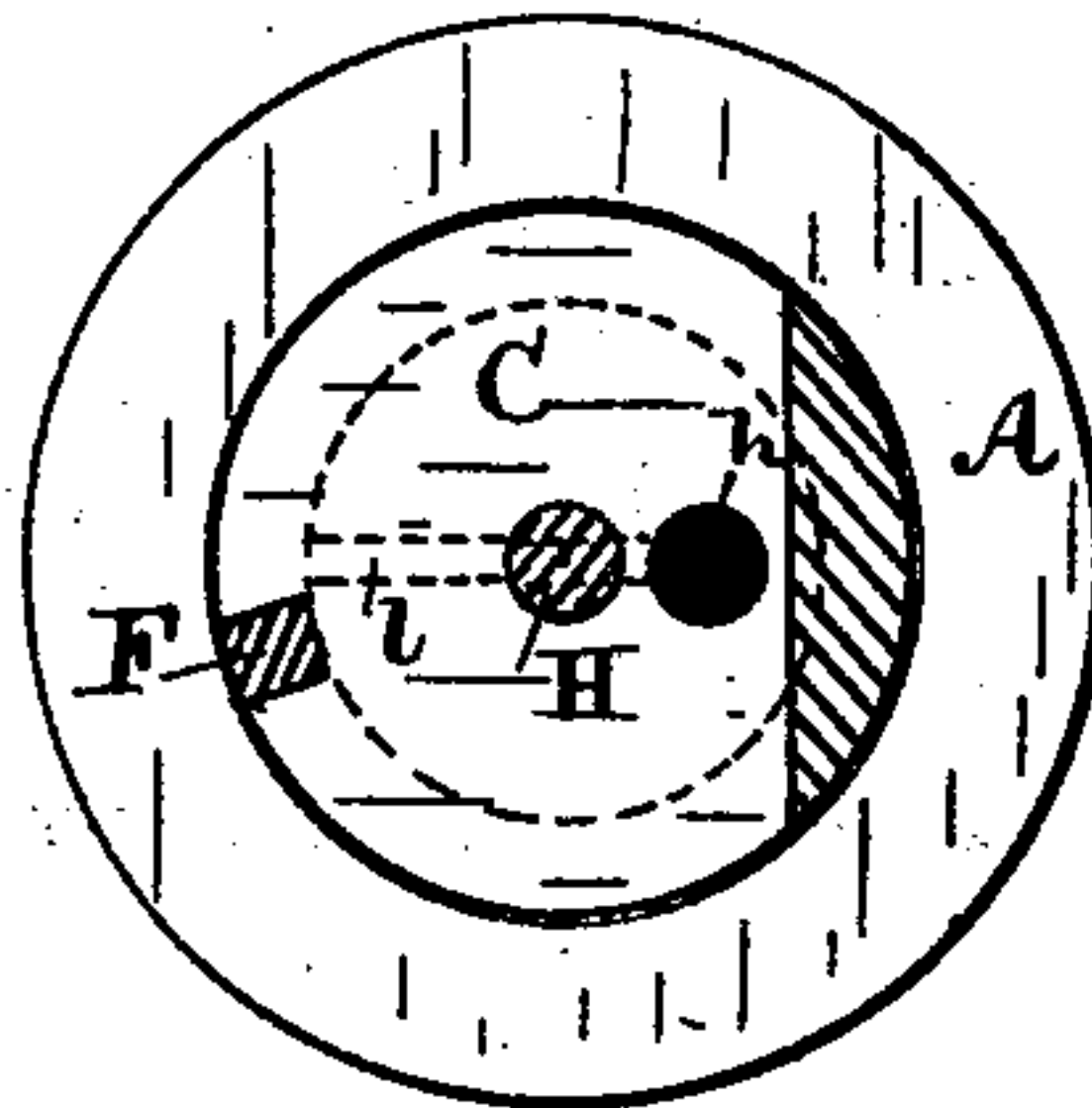
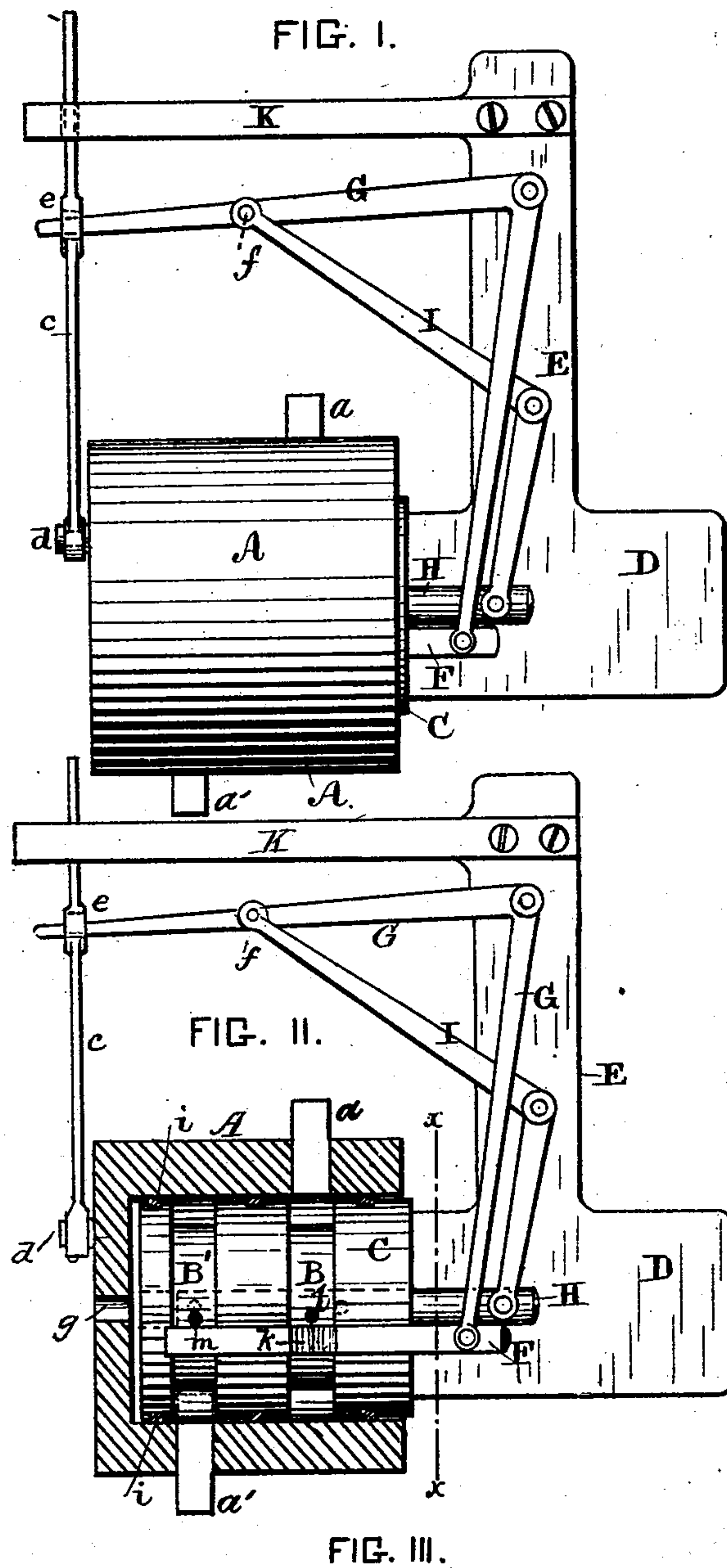


(No Model.)

T. A. MILLER.
Rotary Engine.

No. 243,390.

Patented June 28, 1881.



WITNESSES

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THOMAS A. MILLER, OF GRENOLA, KANSAS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 243,390, dated June 28, 1881.

Application filed March 30, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. MILLER, a citizen of the United States, residing at Grenola, in the county of Elk and State of Kansas, have invented certain new and useful Improvements in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The present invention has relation to rotary engines, and the object thereof is to improve the construction and operation of the same, so as to lessen the friction, and consequently the wear, and also thereby to obtain a larger development of power with a given amount of steam.

The invention consists in the construction and arrangement of parts, as will be more fully described hereinafter, and subsequently pointed out in the claims.

Figure I of the drawings represents a side elevation of my improved engine; Fig. II, a longitudinal section thereof, and Fig. III a cross-section taken on line *x x* of Fig. II.

In the accompanying drawings, A represents the outer cylinder or casing of the engine, which is provided with two inwardly-projecting studs, *a a'*, traveling in annular recesses or depressions B B' in the piston C. This piston has an extended lug, D, to which is secured an upright arm, E, having the operating-levers of the valve-gear attached thereto.

In the piston C is arranged a longitudinal depression, in which a slide or sliding abutment, F, reciprocates, and is operated by a bell-crank lever, G, pivoted to the upright E. This slide forms the abutment against which the steam presses when admitted between the casing and the piston in the annular grooves. The steam is alternately admitted and exhausted by a reciprocating plunger or piston-valve, H, which is moved forward and backward by a bell-crank lever, I, also pivoted to the upright E. To this upright is secured a horizontal arm, K, provided at its outer end with a hole, in which a rod, *c*, reciprocates, said rod being attached to an eccentrically-arranged pin, *d*, secured in the head of the casing. The rod *c* is provided with an eye, *e*, into which

one end of the bell-crank lever G projects and is operated. The lever I is operated by a pin, *f*, secured to the side of the lever G, and as the pin *d* revolves it imparts motion to said lever, and thus moves the valve.

In the end of the casing is arranged the exhaust-opening *g*, and in the opposite end of the piston is the steam-opening *h*. On the interior of the casing are arranged a series of grooves, *i*, in which suitable packing-rings are placed for packing the piston and casing.

In the slide F is arranged a recess or depression, *k*, which allows the interior studs to pass when in its reciprocations the slide with the said depression comes opposite to each other.

The piston is provided with two radial steam-ports, *l m*, through which the steam passes to and from the radial grooves B B'.

The operation is as follows: Steam, being admitted through the port *h*, passes through the radial port *l* into the groove B, and by pressing against the slide F, which closes the space of the grooves longitudinally and presses against the stud *a*, causes the outer cylinder or casing to revolve by the expansion of the steam, which has been admitted through a suitable transverse opening in the piston-valve H. The steam is then exhausted through suitable exhaust-openings in the casing as the slide is moved back to its normal position. The eccentric-pin on the casing imparts motion to the bell-crank lever that operates the slide or abutment, and the stud *f*, secured to the lever G, imparts motion to the bell-crank lever I of the piston-valve as it rotates around the stationary piston. The engine is very easily reversible.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a rotary engine, the combination of the revolving outer casing or cylinder and stationary piston, provided with a reciprocating slide or abutment moving in a longitudinal groove in the piston, substantially as and for the purpose specified.

2. In a rotary engine, the combination of the revolving cylinder A and stationary piston C, provided with annular grooves B B', and ports *h l m*, and a longitudinal groove for the sliding

abutment, all arranged substantially as shown and described.

3. In a rotary engine, the combination of the revolving cylinder and stationary piston C,
5 constructed as described, with a sliding abutment, F, and piston-valve H, operated by bell-crank levers G and I, arranged as and for the purpose set forth.

10 4. The rotary engine herein described, consisting of the revolving cylinder A, stationary piston C, provided with grooves and ports, as specified, the sliding abutment F, piston-valve

H, bell-crank levers I and G, eccentric-rod e, and frame or support D E K, all constructed and arranged substantially as and for the purpose described. 15

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

THOMAS A. MILLER.

Witnesses:

PETER BELVEAL,
JOHN BURDEN.