No. 4,555. PATENTED MAY 30, 1846.

J. BLACK.

ROTARY STEAM ENGINE.

Fig: 2.

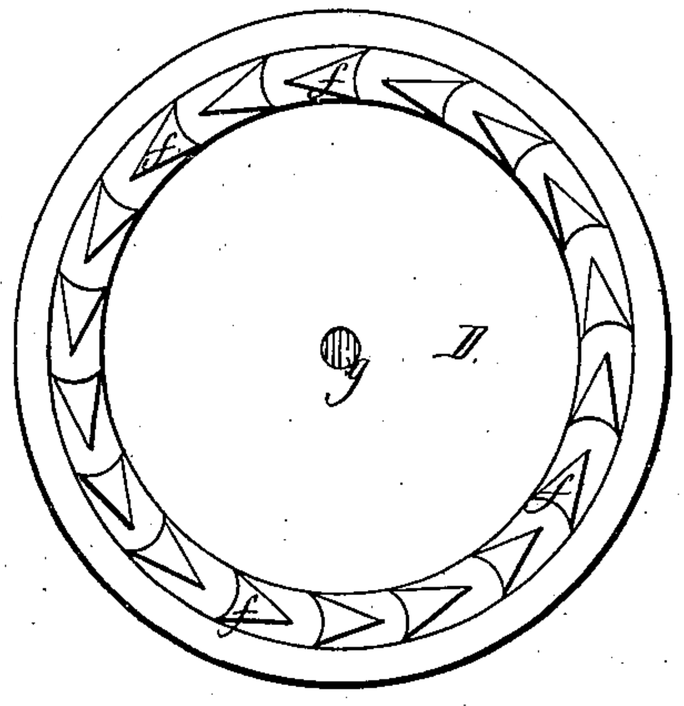

Fig: 3.

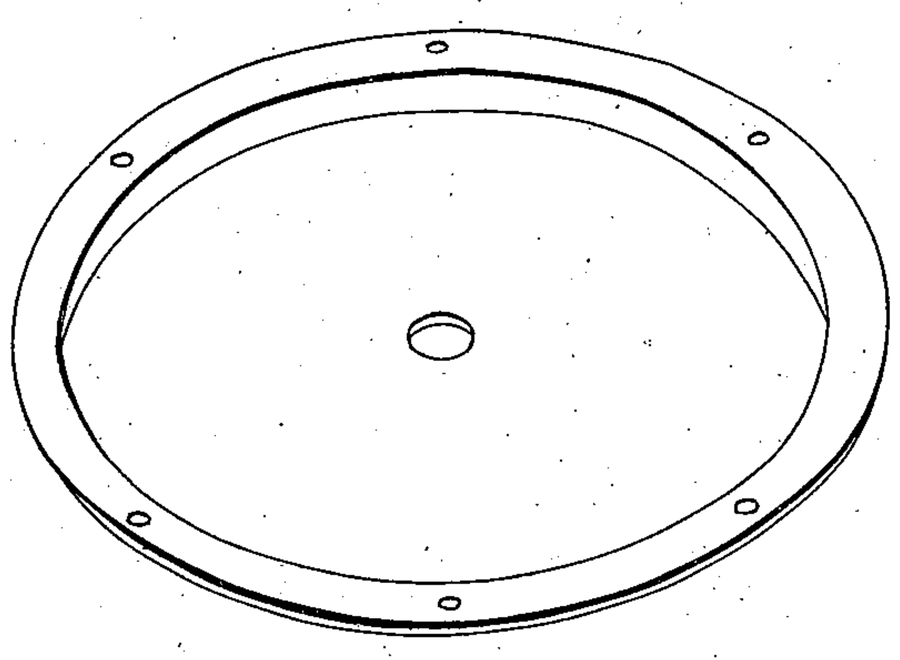

Fig: 1.

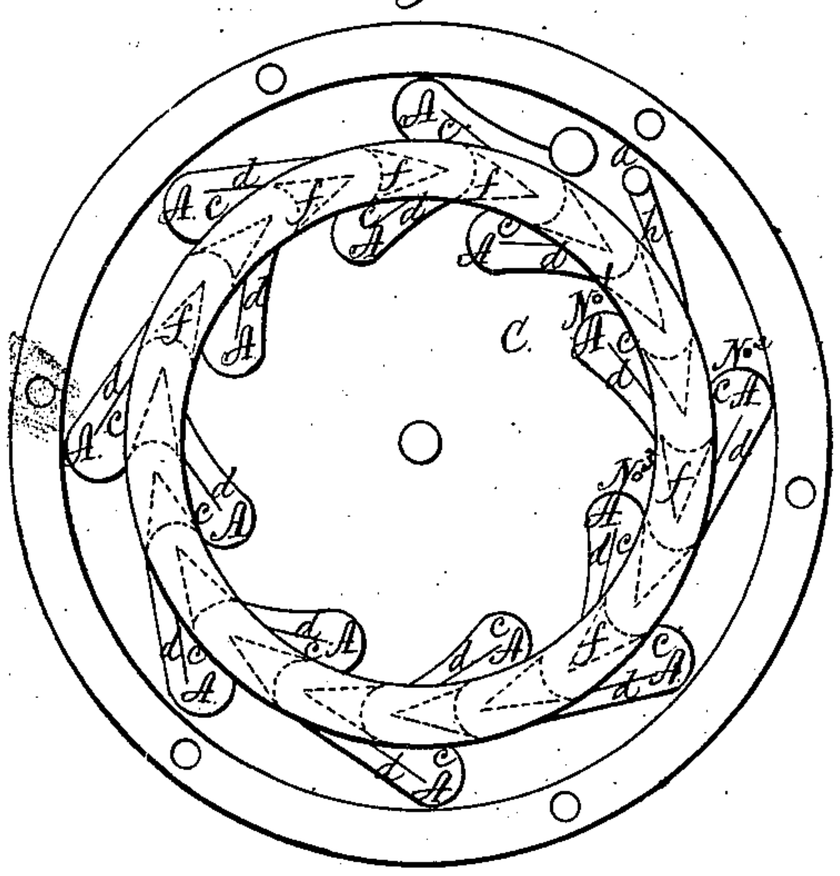

Fig: 4.

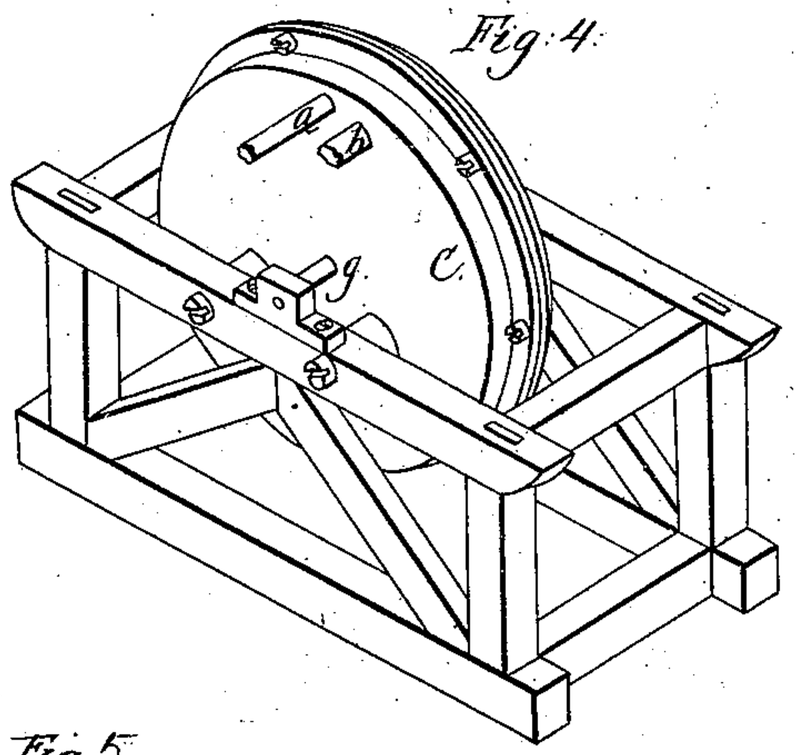

Fig. 5.

UNITED STATES PATENT OFFICE.

JAMES BLACK, OF PHILADELPHIA, PENNSYLVANIA.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 4,555, dated May 30, 1846.

To all whom it may concern:

Be it known that I, JAMES BLACK, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and Improved Acting and Reacting Rotary Steam-Engine; and I do hereby declare the following to be a full and exact description of its construction and operation, reference being had to the accompanying drawings, making a part of this specification.

In the drawings Figure 2 is a plan of a metallic wheel with a shaft *g*, passing through its center. Near the periphery of this wheel, I secure—or cast solid with the same—in a circle, a row of pistons *f*, *f*. Their form is that of a semicircular vertical concave on their face, terminating at a point in the form of a wedge at their rear. The two vertical sides of the concave surface of each piston, and the rear sharp end of the piston next in front of it, should be on a line radiating from the center of the revolving piston wheel.

Fig. 5, is a perspective elevation of one of the rotating pistons. The piston wheel (D, Fig. 2) is secured by bolts and packing between two side casings.

Fig. 1, is a plan of one of the side casings, and Fig. 3, is a perspective view of the other. The shaft *g*, passes through the openings in each side casing.

B, in Fig. 1, is a circular groove, into which the pistons on the piston wheel D, are made accurately to fit, by turning or grinding. On each side of the circular groove B, there are formed steam chambers or channels A, A, in the form of the half of a heart. The steam chambers communicate with the circular groove B, by a broad and narrow passage *c* and *d*, divided from each other by a thin partition. The steam is admitted by the pipe *a*, into the passage *h*, through which it passes into the circular groove B, impinging in the first place against the concave face of one of the rotating pistons, it then passes into the opening *c*, in steam chamber No. 1, and returning through the passage *d*, of the same, acts upon the face of another piston, on its way to opening *c*, in steam chamber No. 2; it returns again through the passage *d*, of this chamber, acting upon another piston on its way to opening *c*, of steam chamber No. 3. In this manner the steam passes, and repasses from one steam chamber to another, in succession until it has traversed the entire circular groove, B, when it enters the escape pipe *b*, and escapes into the atmosphere. The piston wheel D, is kept in a state of equilibrium and friction almost entirely avoided by the peculiar position of the steam channels or chamber on both sides of the rotating pistons and the consequent action of the steam on the pistons caused by this arrangement.

Fig. 4, in the accompanying drawings, is a perspective elevation of my rotary engine secured in a suitable frame.

In constructing an engine to be used in situations where the motion is sometimes required to be reversed, I place pistons upon both sides of the piston wheel, and make a circular groove and steam chambers to fit the same, upon the side casing—reversing the position of the pistons and steam chambers on this side, from those in the opposite side of the piston wheel. The motion of the double engine thus constructed, can be reversed at will, by changing the steam from one side to the other of the piston wheel.

Having thus fully described my rotary engine, what I claim therein as new and desire to secure by Letters Patent, is—

The combination of the rotary pistons with the lateral steam passages or chambers on each side of the same, in such a manner that the steam shall pass from one chamber to another through the passages between the pistons, in regular succession from the steam pipe to the escape pipe; at the same time acting upon the pistons substantially in the manner herein set forth.

JAMES BLACK.

Witnesses:
Z. C. ROBBINS,
H. W. BALL, Jr.